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# THE MEDICAL JOURNAL OF AUSTRALIA.

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No. 12.

## THE ARNETH INDEX IN EASTERN AUSTRALIA.

By E. M. Sweet, M.D., Ch.B. (Melb.),  
Melbourne.

The polymorphonuclear neutrophile is the chief phagocytic blood cell.

Arneth divided neutrophile leucocytes into five main classes, according to the number of nuclei or nuclear fragments they contained. Two nuclear fragments connected by a thread only were counted separately, and the cell belonged to Class II., but if the nuclear matter was in fragments connected by a distinct bridge the whole was called one fragment, and the cell belonged to Class I. In case of uncertainty regarding the class to which a cell belonged, the higher class was chosen. Similarly, three fragments were counted separately, and the cell was classified as of Class III. Class IV., similarly, had four fragments; Class V. had five or more nuclear fragments.

Arneth counted 100 neutrophile cells, and devised his index, which is the sum of the numbers in Classes I. and II., as a convenient means of comparing results. Arneth found his index to be greatly increased in toxic conditions. Cooke (England) also found this index to be much increased in a series of diseases. Minor and Ringer (America) obtained figures pointing in a similar direction. Holroyd (*British Medical Journal*, May 3, 1913) showed that in pulmonary tuberculosis the Arneth index is higher than normal. Atkinson (West Australia) found a similar increase in cases of disease.

Chamberlain and Vedder found that in 50 healthy Filipinos there was a marked increase in index and also some increase in that of 72 American soldiers who had been in the Philippines for over a year. They argued from this that Filipinos have fewer efficient phagocytes than are found in white men in the Philippines or at home, and that this reduction may be a visible indication of a lowered resistance to infections on the part of native races.

Breinl and Priestley (Townsville, Tropical Australia) made Arneth counts on the blood of 150 children there and also on 40 children from Bathurst and Melville Islands, Northern Territory, and found that the average Arneth index was much increased, if compared with the average European Arneth index of 40, being 74 for the former and 71 for the latter. They consider the fact that natives are more prone to contract infectious diseases imported by Europeans to be not the expression of a lowered resistance generally speaking, but the expression of the lack of acquired active immunity. They consider that this increase of index can be regarded as an outcome of climatic conditions in the tropics as such, and that it is not necessary to resort to endemic disease as an explanatory factor.

I have found after observations on 300 eastern Australian school children very similar results for tropical and temperate eastern Australia.

The specimens for examination were taken from:

		Arneth Index.
North Queensland	96 Charters Towers school children, and gave . . . . .	71
	10 Herberton school children, and gave . . . . .	71
South Queensland	22 Mt. Tambourine school children, and gave . . . . .	67
	29 Stanthorpe school children, and gave . . . . .	71
	16 Roessler school children, and gave . . . . .	66
North of North Queensland	28 Thursday Island school children—	
	8 white, and gave . . . . .	73
	20 aboriginal, and gave . . . . .	72.8
Victoria	100 Melbourne school children, and gave . . . . .	73

I arrived at two conclusions:—

- (1) A high Arneth index is very regularly present in healthy children over the whole of the coastal area of Eastern Australia.
- (2) The fact that a high Arneth index is found in healthy children in both temperate and tropical Australia is opposed to the view that the high index in Queensland is due to disease or to tropical climatic conditions.

As well as the above examinations, others were conducted in:—

- (a) 2 adults of over 70 years of age,
- (b) 5 children under 4 years of age,
- (c) 22 Melbourne soldiers between 18 and 45 years of age,
- (d) 15 Melbourne students between 20 and 30 years of age,
- (e) 3 adult labourers exposed to temperatures of  $-8.3^{\circ}$  C. ( $17^{\circ}$  F.) for  $12\frac{1}{2}\%$  of their working time,
- (f) animals exposed to dry raised temperature, and
- (g) 5 persons suffering from disease with high temperature.

An analysis was made of the factors present in the above observations, to determine, if possible, a reason for this high Arneth index over such a large area as eastern Australia.

These factors were: age, occupation, race, external temperature, season, latitude and febrile states.

1. Age.—Two hundred Queensland and 100 Melbourne children were of school age, i.e., between 7 and 15 years of age, and gave an average index, the former of 70 and the latter of 73. The ages of (a), (b), (c), and (d) above were as shown. The average index of (c) and (d) was respectively 73 and 70. The average index of (a) 73, these showing little variability. Fourteen children of 7 and 8 years were compared with 14 children of 12 and 14 years, and both gave an approximate index of 73. In (b), however, each index was higher than 73, and the average was 82. I concluded, therefore, that age, provided it were over seven years, had no effect in determining



variability of the Arneth index in eastern Australians.

## 2. Occupation.—

Division (c) (Soldiers) above, gave an average	
Arneth index of .. .. .	73
Division (d) (Students) above, gave an average	
Arneth index of .. .. .	70

This small difference is well within the error of the experiment.

Division (e) (Labourers) gave an index of .. ..	69.6
which is approximately the same as (d), which was 70.	

Therefore, a wide-difference of occupation had not been shown to have any influence in determining variability of the Arneth index in eastern Australia.

3. *Race*.—Chamberlain and Vedder found a marked increase in the Arneth index for native Filipinos and a slight increase for American soldiers, the former showing an index of 65.8 and the latter 46, as against the European index of 40. They conclude that this may be a visible indication of a lowered resistance on the part of native races.

I took two groups of Thursday Island children, one white, one black, who had been born in that or adjacent localities. Each had entirely white or entirely black parents. All were markedly healthy. Each group showed approximately the same Arneth index, the white 73.1, the black 72.4. Race difference as between these two groups is shown to have no influence on the Arneth index in eastern Australia.

4. *External Temperature*.—Experiments were made on animals to determine the influence of external temperature on their Arneth index. Though no data are at hand as to the stability of the Arneth index in animals and experimental errors cannot be excluded, it seems as though, other things being equal, temperature here was possibly the factor which produced the increased Arneth index.

In Man.—The average temperature in Melbourne is greater than in London by 2.9 degrees (5.3° F.) in summer and 5.9 degrees (10.6° F.) in winter. The Arneth index is greater in Melbourne taken in the summer months by 33 than that given in Europe.

Though this large difference exists, no marked difference was found in Melbourne in specimens taken in January and August, and there is in Melbourne a difference in winter and summer average temperature of 9.1 degrees (16.6° F.). Again, comparing Thursday Island (Lat. 10.3 S.), the wet bulb temperature was 22.7° to 24.4° C. (73° to 76° F.) in June, and Melbourne in January (Lat. 37.4 S.), the wet bulb temperature was 13.2° to 19.4° C. (55.8° to 67° F.), the Arneth index of each was approximately the same. Therefore, differences in external temperature have apparently no marked influence on the Arneth index, as exhibited in the most northern and southern parts of Australia.

5. *Temperature of Febrile States*.—This was studied in Melbourne in connexion with its influence on the Arneth index.

The average Arneth index was found to be 92, and each individual index was much higher than 73, the index found to be normal in eastern Australia.

Though it is evident by this that high body temperature and high Arneth index are associated, and

may be both due to the amount and severity of the toxæmia, owing to the small difference in eastern Australia between the normal and the febrile index, the study here of the Arneth index would not be of much value clinically. Owing to the apparent influence of external temperature on the Arneth index of animals, it would appear that further research on the influence of the external temperature on the Arneth index of man is called for.

An analysis of several other factors present in the observations made in man has failed to disclose any factor apart from disease definitely able to influence the Arneth index.

## MEDICAL WORK SEEN IN THE AUSTRALIAN MILITARY HOSPITALS.

By Walter Summons, M.D., D.P.H.,

Lieutenant-Colonel, Australian Army Medical Corps.

In reviewing the medical work as seen in the First and Third Australian General Hospitals during 1916, one is most of all struck with the obvious freedom from many diseases of the army in France. Compared with the work in the same hospitals in Egypt, there is the small amount of infections of the alimentary canal, a decided lessening of the number of respiratory infections, and a noteworthy absence of acute rheumatism. The class of case dealt with during 1915 in the No. 1 Australian General Hospital has already been written about in these columns. During the first two months of 1916 I was Senior Physician to the No. 1 Australian General Hospital at Heliopolis; I then moved with that Hospital to Rouen. The material on which this article is based was obtained from the British Army in France, and particularly from the Somme area. For the last two months of the year I was transferred to Brighton, to the No. 3 Australian General Hospital. Here again British soldiers generally were admitted, and, of course, in the later stages of their illnesses. Those treated at Rouen were frequently obtained within the first day or two of their reporting sick, and were retained till fit to travel. The most acute cases were kept nearer to the front; but this class included only the few acute lobar pneumonias and the most severely "gassed" cases. In the Army a soldier is either "fit for duty" or "sick," and if sick then he must be in hospital. Provision is made, of course, for the mildest cases to be admitted to a divisional rest camp, and hence, not only is the strain on the hospitals lessened, but also the men are returned to their units sooner. As a rule, one of the three field ambulances takes charge of the rest camp. A large percentage of the medical cases in hospital are in men who should not have enlisted, men who had latent defects that became obvious under exigencies of camp or field life, or men, though physically sound, sooner or later broke down under the strain of active service.

In a paper like this one need only speak in any detail about the groups of cases that are essentially the product of active service, and mention merely be made of the diseases common to civil life, with



reference to the prevalence or modification of the normal type of disease. Chief amongst the former are trench fever, trench nephritis, trench foot, "gassing" and functional neuroses (shell-shock). The perforating wounds of the thorax and brain injuries are most interesting and instructive, but come more in the domain of surgery.

The letters "P.U.O.," "N.Y.D.," "D.A.H.," "V.D.H.," "I.C.T.," and so forth, are recognized officially, and are of great convenience. Once a case is diagnosed and labelled, inconvenience and errors arise in changing of the diagnosis, and as the character of a case cannot always be determined with accuracy in the first few days, hence the "Pyrexia of Unknown Origin" and "Not Yet Diagnosed." "Inflamed Connective Tissue" includes all forms of furuncles, cellulitis and erysipelas, whilst the other letters distinguish the functional "Disordered Action of the Heart" from the organic "Valvular Disease of the Heart."

"P.U.O.," as is obvious, embraces a multitude of diseases. These cases are investigated at the hospitals, and the correct diagnosis ascertained. A number of patients, however, convalesce, and though exhaustive tests have been carried out the case remains undiagnosed, both clinically and bacteriologically. Many of these cases may already have been labelled "influenza," or are called this later on; these are cases of mild fever with malaise and catarrhal symptoms merely. In the more severe febrile cases definite bronchitis and broncho-pneumonia frequently developed. Fewer still were bacteriologically-proved enterica infection, and the majority of the indefinite, prolonged, undiagnosed fevers were doubtless unconfirmed enterica cases. With the universal adoption of prophylactic "T.A.B." injections, agglutination tests are not sufficient to diagnose an enterica infection, and failing the finding of the infecting organism, the diagnosis must rest on clinical grounds. This, in a mild case, modified by prophylactic injections, is not always convincing. Hence the suspect enterics outnumber the proved cases. For a short time, during September especially, patients suffering from dysentery were admitted. The prevalence was nothing to be compared with that amongst the Mediterranean Expeditionary Force. Moreover, many of the cases had a direct relationship with the East. All cases of bowel infections, as soon as clinically diagnosed, were transferred to special hospitals. Here the diagnosis was verified in the laboratory, and it was found that the majority of cases of dysentery were bacillary in origin. The amebic infections were usually recrudescences of a prior Levantine infection.

Trench fever is not an officially-recognized term, but "P.U.O." is the diagnosis made nearer the front, and the words (trench fever) may be added later on, when the diagnosis is definite. It is the only absolutely new disease that the war has brought to light. The symptoms might be explained by considering that a fibrositis existed in the legs. The onset is attended with fever and pain, and tenderness on pressure in the legs. In one group the tenderness is most marked on the tibia, hence the term "shin fever"; but other cases present, in addition, a more marked

tenderness on the calf muscles; in others, again, there is also a hypersensitiveness of the skin; whilst in many there is a general tenderness. There may be also overactive tendon phenomena. In the more severe cases the tenderness extends upwards to the thighs, loins, and in three cases I have found tenderness in the bones of the forearm. These patients are acutely ill, and present an extremely coated tongue, tenderness over the eyeball, and occasionally an enlarged spleen. There are two types of temperature; an intermittent type, with afebrile intervals and relapses, and an irregular intermittent type, but this also shows a relapsing tendency. Early in the illness there is a leucocytosis in many cases up to 20,000 per c.mm., but later on this is not found. Right through there is a disproportionate excess of the mononuclear leucocyte.

In contrast with the prevalence of trench fever, there is the noticeable absence of any form of peripheral polyneuritis. The rarity of polyneuritis in men thus exposed to severe climatic conditions indicates that the condition is not the outcome of exposure, but that the aetiology is more likely to be a toxin. Herpes of varied distribution was not infrequently met with.

Many men, particularly the older soldiers, complain greatly of general pains, especially in the back and legs. A number of these are true, genuine lumbago or sciatica; but from the absence of gross changes and the facility of imitation, these cases of myalgia, so-called, are, as a rule, viewed with suspicion by the medical officers. Grouped under this term, of course, there are cases of early *arthritis deformans*. The symptoms of a chronic *pyorrhoea alveolaris* and of the other toxæmias common to civil life are observed; but on active service all are aggravated by the hard camp life and the exposure to cold and wet. Thus myalgia is a convenient term to signify pain of indefinite origin, and obviates the need to use words as lumbago or sciatica, which the advertiser of quack remedies has so frequently informed the public to be chronic. The employment of these terms tends to the increase of subconscious malingering.

"Trench nephritis" is a term that means more than is implied by the first part of the term. It is an acute nephritis, in the aetiology of which chill and exposure are the prominent factors. Though not entirely absent in the summer, the bulk of the cases are coincident with the cold weather. Exposure produces the condition anywhere, and not merely amongst the men actually in the trenches. Whether chill is the sole factor, one cannot at present state. Varieties of organisms have been found; but these are also found in the urines of non-nephritis cases. Enquiring into the history of the patient, one is struck by the importance of the actual chill, just as in Egypt the chill and exposure seemed more essential in the production of lobar pneumonia than the actual pneumococcus was. The nephritis starts with a low grade of temperature for some days, with the usual signs of œdema, albuminuria, and so forth. Noteworthy peculiarities are the dyspnoea from œdema of the lungs and spasm of the

bronchial tubes, and particularly the persistence of red blood cells and casts in the urine on microscopical examination, several months after the non-detection of albumin by clinical tests. It was not felt justified to send these men to the risks of camp life till at least all tubular casts had disappeared. A certain proportion, not a large one, had a history of previous nephritis, and again, in a similar percentage, the case did not improve, but the albumin persisted. Nevertheless, though uræmic symptoms to the extent of general convulsions were at times present, no death occurred out of a series of several hundred cases. The blood pressure was not elevated, nor were any retinal hæmorrhages found. Thus, though a drain on the Army, the nephritis is not a severe illness as far as life or immediate prognosis is concerned.

Another pathological condition, solely the result of chill and wet conditions, is trench foot. The patients frequently required surgical treatment, by reason of necrosis of tissue, but in the less severe affections often were treated in the medical wards. From the development of a number of fatal cases of tetanus, those with abrasions are given the prophylactic injections of antitetanic serum. In the milder degrees the foot and the leg are swollen, and are extremely sensitive to pressure or even touch. Many feet perspire freely, but are pale. In not a few, in addition to the general hypersensitiveness, there are areas of superficial anæsthesia not limited to particular nerve areas. Thus the condition seems to be a neuritis of the terminal nerve fibres, with stagnation in the peripheral circulation. The treatment is tedious and unsatisfactory, but the indications are to stimulate the circulation and to relieve pain. Those with actual necrosis of the toes or of the extremity are treated by the surgeon. The preventive measures in the firing zone, in addition to the supply of waders and trench boots, are the supply of three pairs of socks per soldier, and friction with whale oil. One pair of socks is being taken to the rear in exchange for another pair that has been washed and dried in the laundry, and the third the soldier wears.

The "gassed" men, by the time they had arrived at Rouen, were past the acute stage or else the gassing had not been so severe as to render evacuation a risk. Few of our patients had been "gassed" by cloud gas, but on numerous occasions groups had been sent down suffering from the effects of gas shells or gas bombs. These missiles not infrequently contain benzyl bromide, a lachrymating gas, but the effect of this passes off within a few hours. The great majority of gas projectiles, however, contained respiratory irritants, mostly chloride of phosgene ( $\text{COCl}_2$ ). The former produced more irritation of the upper air passages. The latter, causing less spasm, penetrated to the innermost recesses of the lungs, where, through the formation of hydrochloric acid, it brings on irritant œdema sooner than that produced by the acids formed from nitrous fumes. Phosgene is also apt to produce circulatory failure, with pallor and collapse. The symptoms thus were mainly those of respiratory irritation with general-

ized bronchitis when the cases reached us. Some cases, of course, were mild, and the patients were soon discharged to convalescence. Not infrequently secondary infections were superadded, and bronchopneumonia developed as a complication. Apart from pneumonia, many of the cases had rhonchi persisting for several weeks; these men were evacuated to England. Other cases had acute emphysema and permanent damage to the lungs. In quite a number of cases nausea and vomiting, with acute pain and tenderness in the epigastrium, were prominent and persistent symptoms. Less common were the cases arising from noxious gases, mainly CO, the result of mining operations, and the fumes, mainly nitrous, from high explosive shell. Accompanying the symptoms the direct result of the gas, there were also in many cases the mental depression and terror due to the "gassing." We had no deaths. Four-fifths of the deaths occur in the first twenty-four hours, and very few succumb after the third day. Thus, it was obvious that the cases likely to prove fatal were too ill to be moved far from the firing-line. The heart and circulation are severely strained by the gas poisoning, and convalescents may show tachycardia. A man who has been badly gassed needs a long rest.

The functional neuroses comprise a most interesting group of patients, commonly said to be suffering from "shell-shock." The great majority of these cases were merely temporary, and the men were not evacuated at all, or only to a rest camp just outside the firing zone. Still, of those that were sent down to Rouen, quite a number had recovered, and could be sent to convalescent camps. The more prolonged and defined cases can be classified according to the most marked feature, thus:—

- (1) General psychical depression.
- (2) Affection of the special senses.
- (3) Marked by tremor.
- (4) Paralytic symptoms.
- (5) Disordered heart's action.

Distinction must be made between those cases that are the direct result of an actual shell exploding near by, and those the outcome of the continued stress and strain of the firing zone. The former are considered by the War Office to be a battle casualty; and are evacuated as shell-shock (W.), whilst the other group may be labelled shell-shock (S.), and are considered as sick, not wounded. Hence the former have the privilege of wearing a gold arm stripe, and appear in the casualty lists. Other synonyms are concussion shell, buried shell. The non-battle group of cases may be labelled as above, or not infrequently as neurosis, neurasthenia, or even debility. It is noteworthy that men with definite wounds are, as a general rule, far less liable to functional neuroses than those in whom no gross trauma has occurred. The condition can best be regarded as a state of nervous exhaustion.

The extent of the nervous shock is frequently demonstrated by the facies. Pallor, depression and listlessness show that, though the bodily mechanism may be undisturbed, the mental balance has had a severe upheaval. Many cases can be considered



melancholic, while the excitement manifested by others puts them in the category of acute mania. The depressed cases are frequently associated with muscular tremor, fine tremor of the arms usually; but in the graver cases coarse tremor, and if the patient can stand, a simulated pseudo-clonus of the legs. This tremor is aggravated by excitement to such an extent that the patient may not be able to feed himself. The paralytic cases usually have a history of direct trauma, such as of having been hurt by the falling of the trench parapet, or of having been buried by shell explosion. Then, again, there are cases brought about by a fall while carrying ammunition or doing "fatigues." All the neurological signs must be carefully investigated, and a definite decision arrived at, based on the physical examination. Once the decision has been come to, it seems best to tell the patient that there is no gross lesion, and that he will get better, provided he makes the effort himself. Then the struggle begins between the medical officer's will power as against the subconscious reasoning of the patient. With firm persistence, daily attention and interest in the patient's progress, combined with the physical aids of massage and saline, or bromide or tonic medication, the patients improve or recover. If the patient is allowed to rest in bed unnoticed, giving way to his fancies, the condition becomes worse in hospital, and unhappy is the future outlook. The same is true of deaf-mutism and functional deafness, aphonia or photophobia. I do not consider anaesthetization desirable as a therapeutic measure. Occasionally, patients can come in with affection of one of the special senses, but with good colour and no mental depression. These are of no importance, and a few sharp words correct the apparent disability. Of the gross organic nerve lesions, all varieties have been seen that are likely to occur in adult males. One can, however, say that at least 90% of the neurological cases are functional. It is interesting to know that four definite cases of acute hyperthyroidism, the direct result of shell-shock, have been seen.

The association of the various types of cardiac irregularity, with the symptoms and history of shell-shock, have led me to add the fifth group to the foregoing list. At times the arrhythmia and the subjective cardiac symptoms date directly from shell-shock; in other cases, it is open to question whether the disturbed heart action was not the outcome of extraordinary muscular effort and the neuroses merely an associated later condition, whilst again the one possibly paved the way for the other. Treatment by rest is most satisfactory. At the first examination, numerous extra-systoles are detected, but may not be found after a few days in bed, or only occur at less frequent intervals. Tachycardia, with dilatation, is a more resistant symptom, and frequently suggests a breaking-down of compensation for some latent and undetected organic lesion.

The strenuous nature of active service conditions has brought to hospital the large group of soldiers who have been well fitted to carry on their civil occupations, but have broken down under the strain of military life. Foremost comes a large group of hearts damaged by a prior affection, which fact has

been known or unknown to the patient. The estimating of the prognosis in these cases depends on numerous factors, and has been of great value to the man's future civil life. Justice could not be done to this large and important group unless discussed in detail.

Of the infections, there have been little variations from the same under civil conditions. One cannot speak with authority of the percentage of enterics or dysentery cases. Cases of cerebro-spinal meningitis and Weil's disease were likewise promptly isolated and treated in special hospitals. This much, however, is clear, that, from the early diagnosis, isolation, and attention to sanitation and other measures, first amongst which are prophylactic injections, the freedom of the Army from infectious diseases is a triumph for medical science. Noteworthy are the wonderful results of antitetanic prophylaxis.

#### THE EARLY SYMPTOMS FOLLOWING INFECTION BY *SCHISTOSOMUM MANSONI*.

By F. B. Lawton, M.B., Ch.B. (Melb.),  
Captain, Australian Army Medical Corps.

In August and September, 1916, twenty-four patients were admitted to No. 3 Australian General Hospital in Cairo suffering from some or all of the following symptoms: abdominal pain, enlarged and tender liver and spleen, pyrexia, bronchitis, urticaria and diarrhoea.

All the patients were Australians, who had not travelled before enlistment. At first it was not clear what was the matter with these men, and blood cultures were made and other investigations were carried out with negative results, but the blood picture afforded the key. In every case a striking eosinophilia was present. This led to prolonged examination of the stools for parasites, and resulted in the discovery of the lateral spined ova of *Schistosomum mansoni*. The ova were found ultimately in the stools of all. The ova were scarce at this stage of the disease, as presumably the majority of the paired adult worms had not yet found a suitable home in the veins draining the rectum.

All of these patients had been in camp at Tel-el-Kebir during the three months preceding the onset of symptoms, and it was there that the infection was apparently contracted. Near the rifle range used by the men in this camp is a fresh-water canal, in which the water flows sluggishly, and the infected men had either bathed or washed in the canal. Most of them had been fully immersed, having swum in the water; but one man had merely washed his hands, and another had washed cooking utensils in it. In the last two the infection was quite as severe as in the others. Some of the patients had swum more than once. None of them had washed in any other fresh water in Egypt, except the shower baths and the water provided for ablution.

Itching of the skin was observed by several on coming out of the water. None of them had used



towels. None of the patients could remember having drunk the water.

Following are notes of three typical cases:—

**Case I.**—Admitted August 18, 1916.

**Past History.**—He was overseer on a sheep station in New South Wales; he had had no sickness. He had arrived in Egypt in June, 1916. The patient had bathed in the fresh-water canal at Tel-el-Kebir about July 18.

**Present Condition.**—This began with a cough about a fortnight ago. He says that his sputum was stained with blood. At the same time he had a headache and loss of appetite. These symptoms continued till four days ago, when he had sharp pains in the upper abdomen, extending round the right side of his back. On admission the pain was general all over his abdomen. He had retching, but no vomiting. His bowels were normal till two days ago, when he had diarrhoea, which continued till this morning. To-day there has been sweating and shivering.

On examination, he looks sick and is flushed, and has a hot, dry skin. The tongue is moist and slightly furred. There are scattered rhonchi all over the chest. There is a little mucoid sputum, which is not blood-stained.

**Abdomen.**—Distension and tenderness are present all over the abdomen. The movement is good. The maximum tenderness is in the right iliac fossa, and over the spleen and liver, which are enlarged and palpable. The urine is normal. A blood culture was made on the night of admission. The result was negative.

August 19.—Leucocyte count, 20,000.

August 20.—The patient had a shiver. A blood film was made and examined for malarial parasites. No parasites were found, but high eosinophilia was revealed.

August 21.—Blood films were made for differential white count. Result:—

Polymorpho-nuclear cells .. .. .	22.5%
Small mononuclear cells .. .. .	15.5%
Large mononuclear cells .. .. .	2.0%
Eosinophile cells .. .. .	60.0%

August 24.—There was urticaria on the body and limbs, which had been present for seven days. The patient complained of discomfort after food.

August 29.—He felt better, and had no pain.

August 31.—The stool was examined by the pathologist. Large and small amœbæ of the coli type and coli cysts, and *blastocystis hominis* were found.

September 2.—The stool was examined again with the same result.

September 6.—The patient complained of headache, a slight shiver and abdominal pain.

September 11.—He had shivered during the night, and complained of headache, abdominal pain and fullness after food. The pain was most severe, and the tenderness most marked in the left lower abdomen. He has a little diarrhoea. The stool was again examined, and lateral spine bilharzia ova were found.

September 13.—There was abdominal pain during the night. There was discomfort after food this morning.

September 20.—The patient had improved, but the abdominal pain and discomfort after food were still present. The liver and spleen were enlarged and easily palpable.

September 23.—The patient was discharged to Australia as a "cot case."

**Case II.**—Admitted August 28, 1916.

**Past History.**—The patient is a fitter in an iron foundry in Western Australia. He has had no illness before enlistment. He had been at Gallipoli for three months. He was sent off with dysentery, and was in hospital in England for three months. He returned to Egypt in February, 1916. He had swum in the canal at Tel-el-Kebir at the end of May and the beginning of June.

**Present Condition.**—The illness began on August 12, when he felt hot and giddy, and had headaches and pains across the lower abdomen. He had shivers and night sweats. There was no cough and no vomiting. He was constipated. Micturition was normal. He was sent to a field ambulance, and was transferred thence to a stationary hospital, where he remained for about a fortnight before going to Cairo.

On admission he did not look ill, and was lying comfortably on his back. The tongue was moist and slightly furred.

The chest was normal. There was good movement of the abdomen, and no distension. There was tenderness in the right iliac fossa and enlargement and tenderness of the liver and spleen.

August 30.—Urticaria had been present for two days.

September 1.—The leucocyte count was 17,000. The differential white cell count was as follows:—

Polymorpho-nuclear cells .. .. .	16.0%
Small mononuclear cells .. .. .	25.5%
Large mononuclear cells .. .. .	3.5%
Eosinophile cells .. .. .	55.5%

September 5.—Diarrhoea was present. The stool was examined by the pathologist. Report: Stool liquid, with no mucus or blood. Heavy lamblia cyst infection. No other parasite found.

September 6.—The man had severe pain in the upper abdomen. There was tenderness over upper part of right rectus, which is rigid.

September 9.—The stool was examined, with a similar result.

September 11.—The stool was examined. Lateral spined bilharzia ova were present.

September 20.—The patient had improved, but still had severe attacks of abdominal pain, and much discomfort after food. The liver and spleen were enlarged. He was very wasted.

September 23.—The patient was discharged to Australia as a "cot case."

**Case III.**—Admitted August 25, 1916.

**Past History.**—The patient was a farmer in Victoria. He had had no illness before enlistment. He had had measles in camp in Australia, and had recovered completely. He arrived in Egypt in February, 1916. He had had influenza in March, 1916, and made a good recovery. He had swum in the fresh-water canal at Tel-el-Kebir at the end of May.

**Present Condition.**—The onset was at the end of June, with weakness, headache and dizziness. He reported sick on July 9 with these symptoms—pains all over and feverishness. He was sent to a stationary hospital, and remained there for three weeks, during which time he had headache and pyrexia. In hospital he developed a cough. He was thought to have an enterica infection, and was sent to an infectious disease hospital on July 31. There the same symptoms continued. The cough became worse, and was very troublesome at night, and he had night sweats. Blood examinations for enterica were negative. His urine was sterile and faeces negative for organisms of the enterica group.

August 18.—Leucocytes, 18,000.

August 20.—The sputum was negative for tubercle bacilli.

August 25.—He was transferred to No. 3 Australian General Hospital.

The patient looked ill. He was pale and wasted. His tongue was moist, with a white fur in the centre. The teeth were very bad, and he had severe pyorrhœa. There were signs of bronchitis in the chest. The liver was not felt, but the dullness extended to the fourth rib in the nipple line. The spleen was palpable. He stated that he had a rash about a fortnight after the onset. The urine was normal.

August 26.—The differential white cell count gave the following result:—

Polymorpho-nuclear cells .. .. .	15%
Small mononuclear cells .. .. .	14%
Large mononuclear cells .. .. .	3%
Eosinophile cells .. .. .	68%

August 29.—The stool was examined. Report: A liquid stool, with blood and mucus present. *Trichomonas intestinalis* and lamblia cysts were present. No amœbæ or amœbic cysts were seen. Many Charcot's crystals.

August 31.—The stool was examined, with a similar result. The same results were noted on September 7, 10 and 11. On September 11th lateral spined ova of *Bilharzia mansoni* were found, and also living miricidia.

From August 29 there was considerable improvement. The cough continued to be very troublesome, especially at night, and caused loss of sleep. There was sometimes abdominal pain and discomfort after food, and his bowels were often loose. He had frequent night sweats. He was discharged to Australia as a "cot case" on September 23.

**Incubation Period.**

The period of incubation was not, as a rule, easy to fix accurately, for the date of exposure to infection could not often be given definitely, and, when the symptoms had appeared some weeks before the patients were transferred to the base, the exact time of their onset was, in some instances, unknown. The shortest incubation period was four weeks, and the longest was about three months. Most often it was between four and eight weeks. This is shorter than the incubation period in vesical bilharziosis, and none of the patients had signs or symptoms of that condition, and ova were not found in their urine. It is possible that symptoms of vesical bilharziosis may have become manifest later, for both types of bilharzia exist in the water where the rectal disease was acquired. A patient who swam in the same water was admitted to No. 14 Australian General Hospital with vesical bilharziosis.

**Symptoms (General).**

**Onset.**—This was sometimes abrupt; but more often the patients felt out of sorts for a few days, with loss of appetite, persistent headache, pains in the back and limbs and dizziness. There was usually a cough in the early stages. Sometimes cough was the first symptom. Vomiting was uncommon. These symptoms were followed by abdominal pain, which was often accompanied by diarrhoea. At the onset the pain was usually in the lower abdomen; but in a few cases pain in the upper abdomen was first noticed, and later in the illness the most troublesome pain was in the right upper abdomen. During the first week of illness there was pyrexia, with hot, dry skin and dirty tongue. In some instances, however, the illness appeared to have been mild from the beginning. The temperature was remittent, with an evening rise to 38.8° or 39.5° C. The temperature remained high for about ten days, and then descended, and sometimes it did not rise again above 37.2° or 37.8° C.; but in other cases, after seven to ten days, another pyrexial period ensued. In a few cases the period of pyrexia extended over several weeks, the longest being about eight weeks. Shivers and sweats were frequent. The latter generally occurred at night, and were sometimes severe. Headache was usually a troublesome symptom. Notwithstanding the raised temperature, the pulse was slow. Dicrotism was observed once. Later there was invariably an evening rise to 37.2° or 37.8° C., either daily or at intervals of two or three days, as long as the patients were under observation.

**Urticaria.**—Urticaria was always present at some stage of the disease, and, in patients who were seen soon after the onset, it appeared in the second or third week. Its duration was variable, being from 12 to 48 hours, as a rule; but in some cases it remained for seven or eight days. Its distribution was general, large wheals being scattered over the body and limbs. Often it had come and gone before the patients were sent to the base. In one case the urticaria recurred several times.

**Blood Changes.**—The red corpuscles were counted and the hæmoglobin estimated in only two cases, and these showed departure from normal. There

was always a leucocytosis. It varied from 13,000 to 22,000, and was usually about 18,000. Differential white cells counts invariably revealed a high eosinophilia. This was never lower than 36%, and was most often about 50%. The highest was 76%.

In cases of *Bilharzia haematobium* previously reported the eosinophilia was generally lower.

Coles<sup>1</sup> found 20% and Balfour<sup>2</sup> 14% to 18%. Douglas and Hand<sup>3</sup> in 50 cases found the eosinophilia was less than 5% in one case, less than 10% in 13, less than 15% in 12, less than 20% in 11, less than 33% in 10, and greater than 30% in 3. Kautsky Bey<sup>4</sup> reported no leucocytosis and red cells not diminished and hæmoglobin 50% to 80%.

In 22 cases the eosinophilia was in

5 cases .. .. .	5% to 10%
12 cases .. .. .	10% to 20%
2 cases .. .. .	20% to 30%
2 cases .. .. .	40%
1 case .. .. .	53%

Catouillard and Gober<sup>5</sup> described the following blood picture:—

Red Corpuscles .. .. .	3,000,000 to 5,000,000
White Corpuscles .. .. .	8,525 to 10,850
Eosinophiles .. .. .	5% to 26%

Nattan Larrier<sup>6</sup> estimated the eosinophiles to be from 5% to 25%. Zweifel<sup>7</sup> gave the blood picture as

Red Corpuscles .. .. .	2,700,000 to 7,780,000
White Corpuscles .. .. .	4,500 to 17,500
Eosinophiles .. .. .	3% to 35%

**Abdominal Symptoms.**—The abdomen was often distended. At first it was tender all over, but the maximum tenderness was over the descending colon and in the right upper quadrant, and in the latter area the muscles were held on guard. The tenderness was very marked in the beginning, but gradually diminished. It never entirely disappeared, some tenderness over the descending colon and over the liver remaining. The liver and spleen were enlarged, easily palpable and tender. Enlargement of these organs was found without exception in the first weeks, but though the liver continued to be palpable, the spleen, after three or four weeks, in many cases could not be felt. Attacks of pain in the upper abdomen were frequent and often severe, but the most distressing symptom was a feeling of fullness in the epigastrium after taking any nourishment. This was a constant and persistent symptom, and was the cause of much discomfort. Attacks of diarrhoea occurred, but were not very common and not severe, and rarely were present for more than 24 hours. During such attacks blood and mucus were often passed. With the diarrhoea, tenesmus sometimes occurred, but gave little trouble. Diarrhoea, however, was, in a few cases, the outstanding feature of the illness, and continued from two to three weeks. When this was so, blood and mucus were abundant in the stools and tenesmus was marked. In the absence of diarrhoea, or when the diarrhoea was present only for a few days and had passed off, a little blood and mucus, often insufficient to attract the patient's attention, was the only abnormality seen in the stool. Often the stool appeared normal. In every case the stool sooner or later contained the lateral spined ova of *Schistosomum mansoni*. Usually the ova were found at this stage of the disease only after prolonged search.

Sometimes they were more readily found in mucus removed from the rectum.

**Pulmonary Symptoms.**—Cough was sometimes the most prominent symptom, and in a few instances it was present during the whole of the patient's stay in hospital. In the chest there were signs of bronchitis, and in some cases there were also patches of consolidation. These signs usually cleared up quickly; but in one case they were present for more than ten weeks, and were still present when the patient was discharged from hospital. Generally, the chest symptoms did not cause great inconvenience; but in some patients the cough was worse at night, and resulted in loss of sleep.

#### Course of the Disease.

In most of the cases observed the tendency was for the symptoms to moderate after a varying time, during which the patients were acutely ill. When the earlier stages were severe and the pyrexial period protracted, there was considerable emaciation and weakness. Though the symptoms moderated, in no case did they clear up completely. All the patients remained weak, but improved a little and their weight increased. They were troubled by frequent headaches, occasional attacks of abdominal pain and diarrhoea, and the feeling of fullness after food. Sometimes the condition of the bowels was normal, and sometimes there was constipation. In some cases the acute stage had been passed before the patients reached the base, and they were in this chronic condition when first seen.

#### Parallelism with Katayama Disease.

The early symptoms in these cases of rectal bilharziosis resembled, in a general way, the early effects of infection with *Schistosomum japonicum*. The symptoms and course of the illness in some of my cases were very similar to those in cases of Katayama disease, as reported by Bassett-Smith<sup>8</sup> and Edgar.<sup>9</sup> Though resembling it in a general way, the illness was less severe than that described in the Katayama disease, for neither ascites, oedema of the legs nor cerebral symptoms were present, and there were no deaths.

A search of the literature showed an absence of any record of these early symptoms in infection by *Schistosomum mansoni*. All state that the first symptoms are those occasioned by the presence of the worm in the mucous membrane of the intestine. Sandwith<sup>10</sup> in 1905 stated that no symptoms were known to show when the liver and lungs were affected.

The only observation indicating any recognition of an earlier febrile state set up by the development of the embryos in the liver is a note by Archibald,<sup>11</sup> who describes three cases of pyrexia of unknown origin which, at the post-mortem examination, were found to have intestinal schistosomiasis. He emphasizes the fact that in these cases there was no eosinophilia.

#### Differential Diagnosis.

(1) **Dysentery.**—When the illness began with diarrhoea, accompanied by the passage of blood and mucus and by abdominal pains and tenesmus, there

was a close resemblance to dysentery. In such cases dysentery was excluded by examinations of the stool for protozoa and dysentery bacilli.

(2) **Enterica.**—The early symptoms sometimes were suggestive of an enterica infection. This was always excluded on further investigation.

(3) **Urticaria.**—In some cases men first reported sick with urticaria, and when they were not very ill, the condition was regarded as the result of some intestinal toxæmia, and they were not sent to hospital till other symptoms appeared. In a few cases the first symptoms to attract attention were painful swellings of the eyelids and lips, and a rash on the lips, and on the limbs, and in the absence of other symptoms a diagnosis of angioneurotic oedema was made.

(4) **Pulmonary Tuberculosis.**—When cough was the most prominent symptom, and there were also wasting, an evening rise of temperature and night sweats, together with signs of bronchitis and consolidation, pulmonary tuberculosis was suspected. Several patients were admitted to hospital with this diagnosis, and repeated examinations were made of the sputum for tubercle bacilli; but none were found.

(5) **Hepatic Abscess.**—In two cases this condition was thought to be present. In the first, the liver was explored with a large needle, and pus was not found. This man had a history of dysentery a few months previously. The second man came in after a diagnosis of bilharziosis had been made in a number of other cases. A blood film showed an eosinophilia and bilharzia ova were found in his stools.

(6) **Ulcerative Endocarditis.**—One man presented a clinical picture very suggestive of this condition. Two blood cultures were made, and both were negative. A blood film showed a high eosinophilia.

I wish to thank Colonel B. J. Newmarch, C.M.G., V.D., Commanding Officer of No. 3 Australian General Hospital, for permission to publish these notes.

To Lieutenant-Colonel C. J. Martin, Pathologist to the Hospital, I am deeply grateful for much help.

My thanks are due also to his assistants in the laboratory, Captain Kellaway and Sister Williams, and to my colleagues on the Medical Staff, under whose care many of these cases were, for opportunities of studying their cases.

#### References.

- <sup>1</sup> Coles—*British Medical Journal*, 1902, p. 1137.
- <sup>2</sup> Balfour—*Lancet*, 1903, II., p. 1649.
- <sup>3</sup> Douglas and Hands—*Lancet*, 1903.
- <sup>4</sup> Kautsky Bey—*Congrès Egyptien de Médecine*, Caire, 1905, II., p. 61.
- <sup>5</sup> Catouillard and Gobert—*Arch. L'Institut. Pasteur, Tunis*, 1908, III., p. 128.
- <sup>6</sup> Nattan Larrier—Quoted in an article on Bilharziosis by Mathias Noc and Leger in Grall and Clarac "Traité Pratique de la Pathologie Exotique Clinique et Thérapeutique," 1913.
- <sup>7</sup> Zweifel—*Arch. f. Schiff. und Tropenhygiene*, 1911, p. 73.
- <sup>8</sup> Bassett-Smith—*British Medical Journal*, 1912, II., p. 1208.
- <sup>9</sup> Edgar—*Journ. of State Medicine*, September, 1913, Vol. 21, No. 9, p. 542.
- <sup>10</sup> Sandwith—*The Medical Diseases of Egypt*, 1905, Part I., page 225.
- <sup>11</sup> Archibald—*British Medical Journal*, 1914, I., 397.



## Reports of Cases.

### A CASE OF RUPTURED DIVERTICULUM WITH FATAL GENERAL PERITONITIS.

By W. R. Groves, M.D.,

Honorary Surgeon, Kyneton Hospital, Victoria.

The patient was a male, aged 68 years, somewhat inclined to stoutness, who had always enjoyed good health, though latterly he had been liable to mild attacks of diarrhoea.

At 5 o'clock one morning, after going to bed "quite well," he was suddenly seized with great pain in the lower part of the abdomen. The pain continued till 7.30 a.m., when I saw him. He had retched once, and passed flatus since the onset of the attack. I found the patient in the greatest distress, pale and with an anxious expression. The pulse-rate was 88, and the temperature 38.7° C. The pain was referred to the lower half of the abdomen, which was tender; but careful examination was impossible, as the patient could not lie still. He had never experienced any previous similar attack. After a rectal examination which failed to reveal any abdominal condition, the patient suddenly felt and looked relieved. The pain entirely disappeared, the patient soon falling asleep. Nothing could have been more dramatic than the change in his condition. Foments and starvation were ordered.

Two hours later I found the patient comfortable and sleeping lightly. The pain had returned once for about 15 minutes since my previous visit, and he had experienced a marked shiver. The abdomen was generally tender, and there was some slight rigidity in its lower half. The tenderness was more decided on the left side. The patient looked and felt comfortable, but the pulse had risen to 100, with a temperature of 37.4° C.

At noon he was still quite comfortable, and had been sleeping soundly, but the pulse-rate had gone up to 120 and temperature to 38.9° C. At this visit Dr. Duncan saw the patient with me. Locally, after overcoming some fairly general and marked superficial hyperæsthesia, firm palpation of the lower abdomen was well tolerated, what deep tenderness there was being most pronounced in the left iliac fossa. The patient's appearance was altogether against any grave emergency, and but for the virulent onset of the illness and the rapidly rising pulse-rate, one would have had no anxiety. An enema was ordered, and the bowels acted well; but an attack of intense pain, which lasted half an hour, was induced.

Two hours later the patient's condition was much the same, except that a little pain occurred at times, and some slight distension appeared, especially of the left half of the abdomen. The patient was then removed to a private hospital, and laparotomy performed at 7 p.m., 14 hours after the onset of the illness.

As the peritoneum was opened, free, milky, inodorous fluid welled up. The appendix was found to be normal, and the pelvic and sigmoid regions were then examined. The mesentery of the sigmoid was found swollen and indurated, and near its junction to the bowel a small patch of lymph directed attention to a minute perforation, from which fluid with a faint fecal odour exuded. A probe passed through this opening entered a diverticulum the size of a walnut, and thence passed into the sigmoid itself. The perforation was closed, and after providing for drainage, the patient was put back to bed. Saline and the Fowler position were resorted to. The patient died three days later.

Acute peritonitis, the result of a ruptured diverticulum, is stated to be a particularly lethal condition, yet whatever chance of recovery the patient may have, will be forfeited unless the source of the infection be eliminated. The mere closure of the perforation as practised in this case would be inadequate, for, presumably, the diverticulum would simply refill and burst again. Resection is surely impracticable, so that the only course appears to be that of fixing the leaking area, if it can be drawn up into the wound, to the surface, and treating the peritonitis on recognized lines.

Then, if recovery occurs, the diseased area can be resected later.

In this case a diverticulum had enlarged in the direction of the mesenteric border, as diverticula sometimes do. A good deal of speculation might be indulged in to explain the sudden and remarkable disappearance of pain in the above case after rectal examination was made; but there is no imagination required to understand the intense attack of pain induced by the administration of the enema, and one learns that an enema cannot be given with impunity in a condition of "acute abdomen" where a ruptured diverticulum is possibly present. This case also illustrates that, whilst in most urgent abdominal conditions a characteristic facies is present, a normal appearance, and even total absence of pain for quite a considerable time, may be compatible with a most virulent peritonitis.

Two articles well worth reading, particularly as the subject receives but scant treatment in the text-books, appear in the *British Journal of Surgery* for January, 1917, and I am indebted to my colleague, Dr. R. B. Duncan for my acquaintance with them. One is written by Hamilton Drummond, and the other by Telling and Gruner. They deal very fully with the subject of diverticula of the intestine, their formation, etc. The latter of the two articles pictures very completely the remarkable variety of clinical and pathological conditions which may arise from the presence of diverticula, ranging from acute general peritonitis through less acute inflammatory conditions (e.g., localized abscess) to very chronic plastic tumour formations easily mistaken for malignant disease (with their mechanical sequelæ, intestinal obstruction, volvulus, etc.). Carcinoma in the sigmoid region is, in some cases, shown to be associated with, and probably caused by, diverticulum formation. The short histories of some 90 cases are given, which illustrate these various sequelæ. After reading Telling and Gruner's article, I think most will agree that a wider acquaintance with this subject will lessen the occurrence of unsolved abdominal problems; and I will conclude by quoting a few extracts:—

1. "Diverticula are potential for mischief out of all proportion to their size and number."
2. "They may cause trouble when only microscopic."
3. "Until quite recently many morbid anatomists of experience have been quite unaware of their occurrence."
4. "Graser found diverticula on microscopic examination in 10 out of 28 cases, and Sudosuki in 15 out of 40. In 100 consecutive aged subjects de Mourgues found naked-eye diverticula 30 times."

## Reviews.

### APPENDICITIS.

In Hamilton Whiteford's "Acute Appendicitis,"<sup>1</sup> no pretence is made of dealing with the subject in the complete manner which the title of the book might lead the reader to expect. The book, indeed, is occupied solely with diagnosis and treatment, and the various points which the author wishes to emphasize are illustrated by the histories of twenty cases, all of which have occurred in the author's practice.

It is a little difficult to define the group of readers to whom this book is expected to make its appeal. The discussion of the operation and after-treatment, which forms the main part of the book, will scarcely appeal to the general practitioner, while the operating surgeon is not likely to heed what is little more than an echo of the opinions of more experienced writers. Mr. Whiteford's experience of twenty-five years serves merely to confirm the teachings of the late J. B. Murphy, and his candid disregard of his own statistics robs the publication of much of its value and of all of its originality.

In the discussion on diagnosis, stress is very correctly laid on the importance of the order of the developing symptoms, on the difficulty at times of excluding urteric stone, and on the need for always examining the chest. On the

<sup>1</sup> Acute Appendicitis, Practical Points from a Twenty-five Years' Experience, by C. Hamilton Whiteford, M.R.C.S., L.R.C.P.; 1917. London: Harrison & Sons; Crown 8vo., pp. 72. Price, 4s. net.

question of when to operate, the author again follows Murphy, and quotes his dictum "Now is the appointed time."

With this opinion the majority of modern surgeons will agree. It is now commonly accepted that no fixed ratio exists between the virulence of the infection and the severity of the early symptoms, so that it is necessary at all times to play for safety. There are still those, however, who believe that if the attack has already persisted more than twenty-four hours, operation should be postponed till the toxæmia then existing has been naturally overcome; and the author gives briefly the main point in Ochsner's treatment of such cases.

The book is a collection of the orthodox views on the diagnosis and treatment of acute appendicitis, and its conciseness represents its main value. There is no originality of thought or method, and the experience of the author has merely enabled him to exercise a ripe judgement in cataloguing the opinions of others.

#### ELEMENTARY ANATOMY.

"Baillière's Popular Atlas of the Anatomy and Physiology of the Female Human Body" is to be commended for the amount of knowledge it conveys in so concise a form. It is rather surprising, however, that a few facts with regard to the genital organs of the male were not included, so that the title of the Atlas need not then have been restricted. As a matter of fact, there is relatively but a very small part of the publication devoted to the description of the exclusively female organs.

There are many excellent figures shown in the plates. Special reference might be made to Figure 3, on Plate III, depicting the lung lobule. The blood vascular system is well illustrated on Plate II. It is a pity that the lymph vascular system, which is rather poorly illustrated on Plate V., was not incorporated in Figure 1, on Plate II. It would have tended to give a better idea of the vascular system in its entirety. In Figure 7, on Plate V., there are excellent diagrams of the neurone, and one would have liked, therefore, to have read in the text some explanation of the neurone and the synapse, and of how nerves are constituted.

There are many persons to whom this "Atlas" should prove of use. Members of first-aid classes, nurses, exponents of physical culture and massage will be well advised to procure a copy.

### Public Health.

#### SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, for the week ending September 1, 1917:—

	Adelaide.		Rest of State.		Totals.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Diphtheria .. .. .	5	1	28	0	33	1
Pulmonary Tuberculosis	0	2	9	5	9	7
Favus .. .. .	0	0	7	0	7	0
Pertussis .. .. .	0	0	5	1	5	1
Scarlatina .. .. .	0	0	3	0	3	0
Morbili .. .. .	0	0	2	0	2	0
Erysipelas .. .. .	0	0	1	0	1	0
C'bro-Spinal Meningitis	0	0	1	0	1	0
Enteric Fever .. .. .	0	0	1	1	1	1
Puerperal Septicæmia ..	0	2	0	0	0	2

<sup>1</sup> Baillière's Popular Atlas of the Anatomy and Physiology of the Female Human Body, with Descriptive Text, by Hubert E. J. Biss, M.A., M.D.; Third Edition: 1917. London: Baillière, Tindall & Cox; Plates by Georges M. Dupuy, M.D. Price, 4s. net.

#### NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending September 8, 1917:—

	Metropolitan District.		Hunter River District.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever .. .. .	6	0	0	0	3	0	9	0
Scarlatina .. .. .	23	0	2	0	10	0	35	0
Diphtheria .. .. .	46	2	6	0	22	2	74	4
C'bro-Sp'l Menin.	4	1	1	0	2	1	7	2
*Pul. Tuberculosis	15	5	0	0	0	0	15	5

\* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

#### VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending September 9, 1917:—

	Metropolitan.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Diphtheria .. .. .	50	3	21	0	71	3
Scarlatina .. .. .	23	0	16	0	39	0
Enteric Fever .. .. .	0	0	7	1	7	1
Pulmonary Tuberculosis	26	10	7	4	33	14
C'bro-Spinal Meningitis	1	—	0	—	1	—

#### QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending September 8, 1917:—

Disease.	No. of Cases.
Ankylostomiasis .. .. .	1
Diphtheria .. .. .	36
Scarlatina .. .. .	3
Pulmonary Tuberculosis ..	7
Enteric Fever .. .. .	1
Malaria .. .. .	2
Erysipelas .. .. .	3

#### TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, for the four weeks ending September 1, 1917:—

Disease.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Pulmonary Tuberculosis	5	1	12	18
Enteric Fever .. .. .	2	1	1	4
Scarlatina .. .. .	1	0	4	5
Diphtheria .. .. .	3	28	21	52
Puerperal Fever .. .. .	0	0	2	2
C'bro-Spinal Meningitis	1	0	0	1

#### WESTERN AUSTRALIA.

The following notifications have been received by the Department of Public Health, Western Australia, during the fortnight ending September 1, 1917:—

	Metropolitan.		Rest of State.		Totals.	
	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
Enteric Fever .. .. .	0	1	1	1	1	1
Diphtheria .. .. .	10	5	1	15	15	15
Scarlatina .. .. .	8	0	0	8	8	8
Pulmonary Tuberculosis	7	4	0	11	11	11
Erysipelas .. .. .	2	0	0	2	2	2
Septicæmia .. .. .	2	0	0	2	2	2
Malaria .. .. .	1	0	0	1	1	1

## The Medical Journal of Australia.

SATURDAY, SEPTEMBER 22, 1917.

### Compulsory Enrolment.

Our attention has been directed to a prevalent impression that the question referred by the Federal Committee of the British Medical Association in Australia to the members on the subject of compulsory service of the medical profession at home and abroad has been disposed of. Many members appear to regard the matter as closed. The Federal Committee determined that a plebiscite on this question should be taken. The wording of the question was decided on, and the Chairman was instructed, in the event of an unmistakable expression of opinion, to inform the Minister for Defence of the determination of the members of the medical profession. The Committee defined what must be regarded as a reasonable majority in so serious a matter. It was held that if three-fourths of those voting expressed themselves in favour of the proposal and if there was a bare majority among the States in favour, action should be taken. Notwithstanding the fact that a three-quarters majority is rarely obtained on a contentious question, it was obtained to all intents and purposes. The fact that the number of those voting in the affirmative was 10 below the three-quarters has been interpreted by the Chairman of the Committee as a failure to satisfy the conditions laid down by the Committee, notwithstanding that all the States returned an affirmative reply. The Federal Committee has therefore to decide whether this overwhelming majority does not call for the action which they determined should be taken in the event of the arbitrarily fixed majority having been secured. Since no meeting of the Federal Committee has been called, the Branches can instruct their representatives on the Committee to indicate in writing to the Secretary that the result of the voting should be communicated to the Minister. Some delay must necessarily ensue before effect can be given to this step, in view of the time involved in the passage

of correspondence from Western Australia to the other States.

The referendum has been criticized by outside bodies, as was to have been expected. It has been stated that many doctors did not vote, and various reasons have been offered to explain this. As a matter of fact, the percentage of those replying to the question was 55—a proportion never before reached when the votes of the members of the British Medical Association in Australia have been taken. That so large a proportion replied may be regarded as an indication that the matter was considered in a very serious light by the doctors. Moreover, there were several replies which arrived at the various centres too late to be included in the returns. The opponents of conscription are trying to belittle the response of the doctors to the question of compulsory enrolment of the medical profession. There is no escape from the facts as they present themselves. Replies were received from 1,361 medical practitioners. No less than 1,011 of these replies were in the affirmative. No pressure was exercised on any one voting. Each man was asked to mark his paper in the privacy of his home in accordance with the dictates of his conscience, and 74.28% intimated that they desired the medical profession to be enrolled for enlistment for service both abroad and at home. These 1,011 men will not be satisfied to leave the matter where it is.

### THE ARNETH INDEX.

The endeavour to trace the physiological and pathological significance of certain appearances of blood corpuscles has led many hæmatologists into regions of speculation. While undoubted progress was made along chemical lines by the study of the reactions of the cytoplasm and chromatin to various reagents, investigators have been on less secure ground when reliance has been given exclusively to microscopical appearance. The term applied to the chief phagocytic cell reveals the danger of having regard to form alone. As is now recognized, a polymorphonuclear leucocyte has one nucleus and not many nuclei, although in certain pathological conditions, such as hæmorrhagic variola, a splitting up has been described. The suggestion of Arneth to base a classification of persons according to the number of fragments or main masses



of nucleus gave room to adverse criticism on the ground that it was entirely problematical to assume that these fragments represented a permanent peculiarity of the cell. The leucocyte is endowed with the property of altering its shape in the passage through the capillary wall and for many other purposes, and in the course of these modifications in form the chromatin constituting the nucleus assumes varied and phantastic shapes. For many purposes in hæmatology it is convenient and permissible to examine the blood in dry films, stained by one or other of the well-known methods. But it must always be borne in mind that the process of drying blood in a smear on a slide alters the shape of the leucocytes considerably. These cells are normally of a soft and mouldable consistency, and when allowed to dry on a flat surface tend to expand. When examined in a living condition in a hanging drop preparation, the polymorphonuclear neutrophile cell is seen to be more or less globular and scarcely larger than a red blood corpuscle. The size and shape of the cell is preserved when the living blood cells are killed and fixed in osmic acid vapour and examined embedded in a thin layer of coagulable, translucent medium. Better specimens are obtainable, as a rule, by suspending blood in paraffin and cutting sections as if it were solid tissue. In preparations such as these, or in sections of tissues with capillaries containing blood, it will be seen that the shape of the nucleus of the polymorphonuclear leucocyte varies according to the manipulations of the histologist or movements of the cells themselves. In sections, the shape will depend on the level at which the cells are cut, and appearances of several distinct, unconnected masses of chromatin will frequently be met with. In order to establish the significance of the Arneth index, if indeed it has any, these cells should be studied after fixation with osmic acid vapour and embedding carried out with extreme care.

In the present issue we publish an interesting contribution by Dr. E. M. Sweet on a large number of observations carried out with the blood of children and adults in different parts of the east coastal districts of Australia. Drs. Breinl and Priestley have worked at the same subject in North Queensland and in the Northern Territory. From these observations it would appear that the index as determined from dry smear preparations is higher than the index measured under

the same conditions in Europe. Dr. Sweet has found that the highest indices are met with in individuals with a raised body temperature. These results are precisely what would be expected from a theoretical consideration of the problem. No essential differences have been shown to exist in the index when applied to persons in this part of the world. The index would be a measure of relative rest on the part of the white cells concerned, if it could be shown that the factor of accident and that of artificiality did not play a part. The index is ascertained by determining the sum of the cells in which the nucleus appears to comprise of one or two main fragments, after 100 have been examined. The division of the nucleus into many masses joined together by delicate threads of communication can be observed only in the process of active diapedesis or when the whole cell is insinuating itself by amoeboid movement through a crowd of other cells. The experience gained by hæmatologists with carefully fixed and embedded blood preparations would lend strong suspicion to the assumption that the Arneth index varies within wide range in blood killed rapidly, and that it is usually high when the blood has been removed from the body some time before fixation.

#### TYPHUS FEVER.

Typhus fever appears in countries with a temperate climate, when war, with its attendant dirt, misery, crowding and famine, impoverishes a considerable section of the inhabitants. Its onset is frequently preceded by mental anxiety or fear. The contagion is conveyed by lice from the diseased to the healthy. A useful summary of recent researches into the ætiology of the disease has been contributed by Miss Muriel Robertson, M.A., to a discussion in the Section of Epidemiology and State Medicine at the Royal Society of Medicine. Our knowledge of the causation of the disease has increased rapidly since Nicolle transmitted typhus fever to monkeys in 1909. As the injection of blood from patients suffering from typhus fever, gives rise to experimental typhus in monkeys, the virus must be present in the peripheral blood of the patients. It appears that the virus exists in the serum from clotted blood, though Nicolle and his collaborators believed that the virus was contained in the leucocytes and was absent from serum. Good evidence is also available that the virus can be removed from serum by filtration through porcelain. Monkeys are rendered immune by an attack of the disease and many (25% *Macacus rhesus*) show a natural immunity. Plotz isolated a pleomorphic anaerobic bacillus from guinea-pigs and monkeys in

which experimental typhus was induced. Olitzky believed that he identified specific agglutinins and precipitins for this bacillus in the sera of patients who were passing through an attack of typhus fever. This work has been recently confirmed by Popoff. Rabinowitsch obtained a coccobacillus, Wilson a micrococcus and Penfold a diplococcus, but Miss Robertson considers these organisms as secondary infections.

In 1909 Nicolle transmitted typhus from monkey to monkey by means of body lice. Ricketts and Wilder immunized monkeys against infection with virulent blood by the bites of infected lice. There seems no doubt that *Pediculus vestimenti* can transmit the disease by biting persons, though there is still doubt as to infection by *Pediculus capitis*. Experimental typhus can also be produced in monkeys by injecting the crushed bodies of lice. The possibility of occasional infection by means of bed-bugs has not yet been definitely excluded.

Rocha-Lima found, in the bodies of lice from patients in a prison epidemic, large numbers of bodies which stained red with Giemsa's stain. Attempts to cultivate these bodies on artificial media failed. Experimental typhus was produced in guinea-pigs by the injection of material from the bodies of lice. The infection was transmitted from guinea-pig to guinea-pig for nearly a year. Injection of the blood of an infected guinea-pig into a monkey at the end of this period induced the typical experimental disease. Rocha-Lima fed lice on patients suffering from typhus fever, and on healthy persons. The lice fed on patients suffering from typhus fever, developed the bodies, while the other lice did not show them. This investigator names these bodies *Richettsia prowazeki*, and is of opinion that they belong to the order *Strongyloplasmata*, and that they should be regarded as *Chlamydozoa*. When Rocha-Lima kept lice at 23° C., the bodies did not develop, and the injection of material from the lice did not produce experimental typhus. If the lice were kept at 32° C., the bodies appeared, and injection of the material gave rise to the disease.

#### LOCALIZED ANOMALIES OF HUMAN EMBRYOS.

Careful observations and deliberate experimentation have revealed the fact that human monsters are not produced by pathological processes handed down from parent to the embryo, either as germinal or as hereditary affections, but are caused by a faulty environment of normal embryos. Opinions differ as to the nature of the environmental changes which lead to the deformity of the embryo. According to Franklin P. Mall, a faulty implantation of the chorion produces its effect on the embryo. A very young ovum may be so affected that the entire embryo is soon destroyed, until only the umbilical vesicle within the chorion is left, and even the vesicle may disappear, leaving the collapsed chorionic membrane. In the most extreme case the whole embryo and chorion disappear. The same author now endeavours to assess the significance of localized anomalies of human embryos on the basis of a study of the first thousand

abortions preserved in the Carnegie Institute in Washington.<sup>1</sup> From the Johns Hopkins University a collection of over 2,000 embryos was contributed, and the collection is increasing at the rate of about four hundred each year. He distinguishes sharply between normal embryos with localized anomalies and pathological embryos. Some difficulty is experienced in setting up a satisfactory definition of a normal embryo, but the chief obstacle is removed if the standard of normality is judged on the basis of human and comparative embryological knowledge. A sharply defined, well formed white embryo, with blood vessels shining through its transparent tissues, is regarded as normal. Moreover, he does not consider an embryo pathological if it appears normal, even if its membranes are obviously changed by some pathological process. The abnormalities met with in the embryos collected after abortion are classed into seven groups. There is a large group, probably capable of subdivision, of the dried up and deformed or macerated and soft embryos. The next is the so-called "stunted variety," in which the head and often the extremities are atrophic. The next group consists of embryos with advanced stunting, and so little differentiation that the extremities are almost eliminated, and only the head end can be recognized with certainty. When the process of dissociation of the embryo begins in still earlier stages, the result is a nodular body in which the coelom, heart and central nervous system can be made out, and at times there are pigmented spots marking the position of the eyes. In the next group the embryo and umbilical vesicle are completely destroyed; then follows a group in which only the chorionic vesicle containing the coelom remains, while in the last the form of the ovum is completely destroyed and the specimen consists of villi which have undergone fibrous or mucoid degeneration. In analysing the first thousand specimens, he found that about 40% were pathological embryos and ova. In approximately 10% of the pathological specimens there were localized anomalies, while in 6% of the normal embryos were these anomalies detected. Localized anomalies were rarely seen in normal embryos, and were very rarely met with in pathological specimens after the fifth month. This means that embryos with localized anomalies are usually aborted before the middle of pregnancy. On the other hand, it must be pointed out that the series was poor in specimens of the second half of pregnancy. The analysis further revealed that localized anomalies were twice as frequent in pathological as in normal embryos. The anomalies described include *spina bifida*, *hydrocephalus*, *cyclopia*, *anencephaly*, *ectopia of the bladder* and defects of the extremities. Dr. Mall concludes that serious lesions of the chorion which give rise to anomalies of the embryo also produce abortion. When the alteration in the embryo and in the chorion is slight, the pregnancy proceeds to full term, and the result may be a monster or an infant presenting a well-recognized malformation. He holds that the changes leading to these anomalies affect the nutrition of the embryo and are of the nature of dissociating or cytolytic changes. He argues that the onset of the changes can be timed to a period before the development of the particular tissue involved. A hare lip cannot be

<sup>1</sup> The American Journal of Anatomy, XXII, I, 1917.

produced by nutritional disturbance acting after the upper jaw has been formed, neither can *cyclopia* begin after the eyes have started in normal development.

#### "RECALLED TO LIFE."

A new war publication, entitled "Recalled to Life," has just been issued by the War Office, the Pensions Ministry, and the Joint War Committee of the Red Cross and St. John's Societies. It is edited by Lord Charnwood, with the assistance of Mr. Everard Cotes, and is described as a "journal devoted to the care, re-education and return to civil life of disabled sailors and soldiers." The first number is replete with information of great importance, and supplies an urgent need. Its contents are as follows: There is an introduction, skilfully written, indicating the scope and aims of the journal; then follows an engrossing article by General Sir Alfred Keogh, G.C.B., the Director-General of Medical Services, on the treatment of the disabled, outlining the organization, the arrangements for pensions, the means adopted to substitute useful exercise for unproductive gymnastics in the restoration of lost functions of limbs, the after-care of the blind and the basis for an efficient after-care of the deaf, and, lastly, the question of the provision of artificial limbs. The third article is an address delivered by Lieutenant-Colonel Sir Arthur Boscawen, M.P., the Parliamentary Secretary in the Ministry of Pensions. This address was delivered to the members of the Inter-Allied Conference at Paris on the "Treatment and Training of Disabled Soldiers." Then follows a paper by Colonel Sir Robert Jones, C.B., Military Inspector of Orthopaedics, on orthopaedic surgery in its relation to the war, in which general principles are admirably set forth. The fifth and sixth items embrace a series of short annotations, entitled "A Talk with the Disabled" and some miscellaneous descriptions of institutional treatment, and some suggestions. Captain Basil Williams speaks interestingly on pensions, and the eighth article is taken up with an account of the work of re-education and training and of the arrangements for pensions in France and Germany. This report has been prepared by the Intelligence Department of the Local Government Board. The remainder of the volume is given up to minor notes, which are nevertheless important and interesting.

The dominant note in the principal articles is that, while the British Government recognizes as its imperative duty the restoration of as much of the impaired function of wounded or otherwise incapacitated soldiers and sailors as is humanly possible, the desire of individuals and groups of individuals to contribute to the repatriation of our fighting men must be co-ordinated and utilized, both in the interests of the men and because of the value of voluntary effort. In view of the fact that Australia has the same problems to face and to solve, we propose to defer a discussion of Sir Alfred Keogh's splendid memorandum for the present. Future issues of the journal will no doubt supplement the information given in the first number and present other aspects of a subject of which the world as yet knows but little. The value of each suggestion must be estimated on common-sense lines, until

experience can teach what it is capable of effecting in real life. Some of the information in "Recalled to Life" is based on actual working institutions; some is the outcome of ingenious planning and organization. All of it, however, is worthy of careful and painstaking study, and the Editors are to be congratulated on a fine contribution to their difficult problems.

#### THE HEALTH OF TASMANIA.

On July 28, 1915, the Chief Health Officer, Dr. S. A. McClintock, resigned his office. From July 11 to December 11, 1915, Dr. A. H. Clarke took on the duties of the position. At the end of this period the Federal authorities placed the services of Dr. D. V. Robertson at the disposal of the Department. On June 7, 1916, Dr. Clarke again became Acting Health Officer, a post which he continued to fill until appointment of the present Health Officer of Tasmania, Dr. C. L. Park. Dr. Clarke is therefore at a disadvantage in having to submit the annual report for the year ending June 30, 1916. Notwithstanding this disadvantage, he has prepared an admirable report, which contains all the necessary information compressed within the compass of eleven pages of print.

##### General Administration.

The unsatisfactory state of the Health Department impelled the Premier to make arrangements with the Commonwealth Government for the purpose of obtaining the services of Dr. J. S. C. Elkington to investigate the working of the Department. Dr. Elkington submitted a comprehensive report, upon which the reorganization of the administration and executive functions of the Department has been based. In December, 1915, the Secretary of the Department journeyed to Melbourne, Sydney and Brisbane, and studied the office systems of the Departments of Health in these cities. Dr. Elkington advised that industrial administration did not form any part of the training of a medical sanitarian. He was further of opinion that, until the Chief Health Officer had been able to master the large amount of varied detail required for the routine and special work of this Branch, he would be but little more than a figure-head, if he acted as Chief Inspector of Factories as well. Accordingly, the Chief Health Officer was relieved of the duties connected with the administration of the Industrial Acts in February, 1916. Emphasis has been laid on the necessity of drastic amendment in many directions of the "Public Health Act" of 1903. It has also been suggested that the "Food and Drugs Act" of 1910 should be amended in various particulars. Dr. Clarke points out the advisability of distinguishing between dangerous infective diseases necessitating control by a central authority, and ordinary infective processes with which the local authorities might be expected to deal. He urges that wide powers should be given to the Chief Health Officer for dealing with the former class of disease. In addition to the changes incidental to the adoption of the recommendations of Dr. Elkington, a material change has been effected by the co-ordination of the Government Medical Services. This involved subjecting all medical work performed for the Government to one responsible medical officer.

##### Constitution.

The Medical Branch of the Department was re-constituted, and comprised an Acting Chief Health Officer, a part-time Government Bacteriologist, a Secretary, a Clerk, a Chief Inspector and an Inspector. The experience of the first six months revealed that this staff was too small to cope with all the work that had to be performed, and temporary assistance therefore became essential. The appointment of an additional permanent officer was being contemplated at the time when the report was drafted. The expenditure of the Department amounted to £3,625, a modest sum, in view of the economic importance of the efficient administration of hygiene and public health.

##### Local Health Administration.

Dr. Clarke points out that some of the local health authorities are active, and discharge their duties connected with



the control of the sanitary conditions in a very satisfactory manner; while others, which unfortunately constitute the majority, have been guilty of very serious neglect. In a few districts, the existence of disgraceful conditions of sanitation has been revealed. He refers to the necessity of constant and skilled supervision, and urges upon local authorities to secure the services of a medical officer of health and a competent sanitary inspector. The Department has endeavoured to render assistance in every possible direction to the local authorities. When complaints are received, the local authority is called upon to undertake an enquiry, and to issue a report. If it can be shown that there has been laxity on the part of the Council in dealing with the matters brought under their notice, the Department take immediate action to effect a remedy.

#### Notifiable Diseases.

The first outbreak of epidemic cerebro-spinal meningitis that has been known in Tasmania occurred in the second half of 1915. The disease was declared a "dangerous infectious disease" on September 23, 1915, and strict isolation was enforced, in accordance with the provisions of the "Public Health Act, 1903." The patients were admitted to the General Hospital, Hobart, and additional accommodation was made available at the Vauluse Hospital. Fortunately, there was no need to take advantage of this additional accommodation. In the north, the patients were isolated in the Carr Villa Hospital. In addition to the isolation of patients, means were adopted to detect and isolate carriers, and to apply disinfection, when necessary. A recrudescence of the disease occurred in May and June, 1916. The mortality in the second outbreak was lower than that in the first. In all, 57 cases were notified during the course of the year.

A considerable amount of diphtheria was distributed throughout the island. The total number of cases notified was 988, of which 197 occurred in Launceston, 187 in Hobart and 101 in Devonport. Owing to the infection of a number of school children, a systematic examination of the fauces of the pupils at the Hobart State Schools was carried out. In this way the sources of infection were frequently recognized, and the carriers isolated as a prophylactic measure.

In 28 of the 51 municipal districts enteric fever was met with. The total number of cases notified was 153, including 33 cases in Hobart, 21 in Ringarooma, 12 in Launceston and 12 in New Norfolk and 10 in Latrobe. In Ringarooma a single pan sanitary service had been in existence for some time, and to this fact the spread of the disease was attributed. The local authority, on a strong recommendation from the Department, started the institution of a more efficient service. The occurrence of paratyphoid fever, through the intermediation of returned soldiers, was suspected by the presence of a number of mild cases of enteric fever.

Scarlet fever was prevalent in many districts, and no less than 125 cases were notified. An outbreak at Gordon of 16 cases was attributed to the neglect to isolate the patients properly.

A sad story is unfolded in regard to the prevalence of pulmonary tuberculosis. During the course of the year 85 cases were notified in Hobart and 34 in Launceston, out of a total of 241 for the whole State. But few municipal districts were entirely free of the disease. Reference is made in the report to the necessity of controlling persons capable of spreading infection, or, in other words, of isolating the advanced cases.

The number of cases of puerperal fever notified was 20, of which nine occurred in Hobart. Medical practitioners are requested, when notifying these cases, to give the name and address of the midwife or nurse in attendance. The Department makes it a practice to prevent the midwife or nurse from following her vocation for a period of 21 days. Means are also taken to ascertain whether negligence or carelessness has contributed to the onset of the condition.

There were, in addition, 53 cases of varicella, 3 of anterior poliomyelitis and 11 of *ophthalmia neonatorum*.

The basis for a control of venereal disease in Tasmania at the time covered by the report was restricted to the

Contagious Diseases Act of 1879, the provisions of which were limited to one sex under very restricted conditions. Since the issue of the report, fresh legislation, based largely on the recommendation of the Committee of the Department of Trade and Customs appointed to enquire into the causes of deaths and invalidity in the Commonwealth, has been introduced. The steps taken in the vain endeavour to control these diseases with inefficient means has therefore now but historic interest. It is noted that the patients under treatment during the year under review numbered seven, and the cost to the State amounted to £19 5s. 4d. per patient.

In an appendix, the death-rates of various diseases are reproduced from the returns of the Government Statistician. It appears that tubercular diseases caused 6.53 deaths per 10,000 persons living. Diphtheria caused 1.46, pertussis and influenza 1.25, enteric fever 0.85, syphilis 0.55, scarlatina 0.25 and morbilli 0.15. With the exception of diphtheria, these mortalities are all higher than those registered in 1914.

#### Rat Extermination.

For reasons which are not disclosed, the work of rat destruction was discontinued at the end of June, but was again resumed in February, 1916. The cost of this work was borne equally by the Government, the Marine Board of Hobart and the Hobart Local Authority. In five months 942 rats were caught, at an expenditure of £60. It is anticipated that a large number of rats get away with the bait and die in their burrows. It is proposed to make a regular bacteriological examination of the carcasses, for the purposes of ascertaining whether any of the rodents are infected with plague.

#### Food and Drugs.

Dr. Clarke points out that the local administration of the measures for the control of the purity of foods and drugs was very deficient. A complete survey of the State was planned in January, but owing to the many pressing duties of the inspectors, it was not completed within the six months. The provisions of the regulations were explained to those handling food, and special attention was directed to the necessity of proper protection of food from contamination, of cleanliness of milk, ices and ice-creams, and of the proper handling of meat. It was found that in Hobart neglect on the part of the butchers constituted a disgrace to the community. In the majority of cases no difficulty was experienced in having the defects remedied.

#### Midwives.

During the course of the year 282 midwives took out their annual certificates. The names of 23 persons were added to the register, bringing the total up to 598. Many of the midwives on the register are too old to practise, while others have left the State. An enquiry elicited the fact that some of the midwives had continued to practise, notwithstanding that they had failed to apply for the annual registration. Police-court proceedings were taken in these cases. When a midwife fails to take out a certificate for two years, she has to explain to the Medical Council the reasons for having omitted to take out the certificate or for having ceased to practise and to give an account of her conduct and employment in the mean time.

#### Bacteriological Work.

The Government Bacteriologist, Dr. Terence C. Butler, appends a short report of the work conducted by him during the year. A considerable amount of diagnosis work was carried out, and, as has been mentioned, much energy was expended on the tracing of the sources of infection of diphtheria in school children. The work connected with the epidemic of cerebro-spinal meningitis also absorbed much time and care.

We have to announce the death of Dr. Charles Carty Salmon, M.H.R., of South Yarra, which took place on September 15, 1917.

## Abstracts from Current Medical Literature.

### THERAPEUTICS.

#### (97) Effect of Alcohol on Respiration.

H. L. Higgins has studied the action of alcohol upon the respiration of seven men (*Journ. of Pharm. and Exper. Therapeutics*, May, 1917). The investigation was designed to study the effect of alcohol on the respiration in influencing the respiratory centre itself, in changing the tone of the bronchial muscles, thus altering the volume of the dead space, in increasing or in decreasing the gaseous exchange, or in producing a different rate, rhythm or character of breathing. The sensitivity of the respiratory centre was inferred from measurements of the tension of the alveolar carbon dioxide before and after the administration of alcohol. The volume of the dead space was estimated by determining the alveolar concentration of carbon dioxide by Haldane and Priestley's method, and ascertaining the gaseous exchange with the aid of the valves and spirometers of Tissot. The rate of breathing was counted, and the character of the breathing examined on tracings taken with a pneumograph. The alcohol was given as pure ethyl alcohol diluted with water and flavoured with cold cereal coffee. The quantities of alcohol given, varied from 30 c.cm. to 45 c.cm. Full details are recorded of the results of each experiment. The investigation shows that alcohol may increase the sensitivity of the respiratory centre, though sometimes this effect is absent. The increased respiratory sensitivity is inferred from a fall in the tension of the alveolar carbon dioxide. Alcohol has no action on the bronchial muscles except an occasional bronchial dilatation. Unless restlessness is induced by the alcohol the rate of breathing is not altered. Heat production, estimated from the consumption of oxygen, is not increased as a rule, though an occasional rise of heat production of 5 to 7% has been observed. In 45% of the experiments the rate of the pulse has been accelerated. A study of the respiratory quotients obtained in these experiments, reveals that 45 c.cm. alcohol does not burn at a faster rate than 30 c.cm., that 30% of the total metabolism is due to the combustion of the alcohol, and that, on the assumption that the alcohol is burned at an uniform rate, 30 c.cm. are burned in 8 hours and 45 c.cm. in 12 hours. The ventilation of the lungs is diminished after the administration of alcohol on account of the lessened production of carbon dioxide.

#### (98) Medication with Heterologous Proteins.

F. J. Scully has treated 25 patients, suffering from acute articular rheumatism, with intravenous injections of

a foreign protein (*Journ. Amer. Med. Association*, July 7, 1917). Each injection gives rise to a reaction characterized by a chill accompanied by headache and nausea. The chill is followed by sweating. The temperature rises for three or four hours after the chill and falls slowly to normal in the next 24 hours. The number of leucocytes in the circulating blood is diminished after the injection, but soon increases to a maximum, which is reached six hours later. The blood pressure falls after the chill and does not rise for several hours. The foreign protein, used in the treatment of this group of patients, was an emulsion of typhoid bacilli heated to 70° C. for two hours. One cubic centimetre contained 150,000,000 bacilli. Doses of 0.25 c.cm. or 0.5 c.cm. were given into a vein. The patients were kept well covered during the chill. They were kept in bed for three days after all the symptoms had disappeared. The results observed with the 25 patients were as follows:—Ten recovered after a single injection. The disease was recent and uncomplicated. Three patients recovered slowly. These received three injections. Two patients relapsed on the tenth day after apparent cure with one injection. These patients remained well after a second injection. Four patients received only temporary improvement from the injections and did not recover until treated with salicylates. Four other patients did not improve until given intravenous injections of sodium iodide. One patient developed delirium tremens and died. The author considers that the use of these injections is contra-indicated in patients with cardiac lesions and in those who are addicted to alcoholism.

#### (99) Treatment of Acute Anterior Poliomyelitis.

H. Ulrich has investigated the results obtained by treating 120 patients, suffering from acute anterior poliomyelitis, with different methods of specific early therapy (*Boston Med. and Surg. Journ.*, July 19, 1917). The patients were inmates of the same hospital during the same epidemic. They have been divided into six groups. Those in group A were treated with three intraspinal injections of immune serum. Those in group B were given similar injections of normal serum. Those in group C were injected with their own cerebro-spinal fluid. Those in group D were treated by lumbar puncture. Those in group E were not given any treatment. Group F includes 19 patients who died within 48 hours from admission to hospital. Details are given of the treatment of the individual patients in each group. The result of treatment was considered six weeks after admission. The number of cases in each group was roughly identical. The results are summarized under headings of marked, moderate, slight and no improvement and of fatalities. No differences are shown between any of the different modes of treatment. Forty per cent. of the patients show

marked improvement, and 40% show moderate improvement. The author concludes that the different forms of treatment are useless, and that lumbar puncture causes unnecessary pain to the patients and disturbs their rest. In this way, he believes, permanent harm is done to the patients who need complete rest in the early stages of paralysis.

#### (100) Picric Acid as an Antiseptic.

T. F. Broon has applied picric acid as an antiseptic in the routine treatment of 3000 wounded patients in an Australian Auxiliary Hospital in Egypt (*Journ. Roy. Army Med. Corps*, June, 1917). An aqueous solution containing 1 per cent. picric acid was applied on thin gauze to superficial wounds. Suppurating sinuses were washed with a stronger solution. Arm and leg baths were used with a 5% solution in patients with suppurating fractures and with crushed tissues. The results were uniformly good. Healthy and vigorous granulation rapidly ensued. The author noted the absence of any coagulation of the tissues and of any case of poisoning due to absorption. The discolouration of the skin lasts many months, but the staining does not extend to the subcutaneous tissues or to the muscles.

#### (101) Treatment of Hæmoglobinuria.

R. A. Torrance and F. H. Bowman (*U. S. Naval Med. Bulletin*, April, 1917) report the histories of eight cases of hæmoglobinuria occurring in Haiti. They have treated these patients with quinine, and have found that the use of quinine is most effective when the hæmoglobinuria is due to malaria. In most of these cases quinine was given intramuscularly, since the authors were unable to give intravenous injections owing to special circumstances. In addition to the administration of quinine, large amounts of water containing bicarbonate of soda, were given by the mouth. The authors consider that it is far better to risk the chance of some slight hæmolytic action of quinine than to expose the patient to the enormous destruction of red cells caused by the rapid multiplication of the malaria parasites.

#### (102) Hypertonic Salts Solution in Gonorrhœa.

C. H. Dragoo (*U. S. Naval Med. Bulletin*, April, 1917) has used Wright's hypertonic salt solution in conjunction with argyrol in the treatment of gonorrhœa. He reports detailed histories of three cases in which the results were satisfactory. He tested this treatment on patients who had freshly acquired infections and who had received no previous treatment. The patients were confined in hospital, but the diet was not regulated, and no other treatment employed, except rest in bed for three days from the beginning of the



disease. Irrigations with Wright's solution for one and a half hours were employed night and morning. Each irrigation was followed by an injection of argyrol, which was retained for five minutes. In the first case no gonococci could be found after the fifth day. In the second case the gonococci disappeared on the twelfth day, while the third case revealed gonococci in the smears until the eighteenth day.

#### UROLOGY.

##### (103) Treatment of Median Bar Obstruction.

H. G. Bugbee defines the median bar obstruction of the vesical neck as an elevation at the apex of the trigone caused by an inflammatory change, submucous glandular hyperplasia or median prostatic hypertrophy (*Urologic and Cut. Review*, July, 1917). In dealing with the use of high frequency spark in the treatment of this form of obstruction to the flow of urine, he limits himself to cases in which the median lobe of the prostate forms a fibrous ring around the vesical neck, as well as to cases of general carcinoma. Before the treatment may be instituted, a correct diagnosis is essential. There must be absence of lateral lobe enlargement and of anterior lobe enlargement, acute prostatitis and vesiculitis, and no nerve lesion may be present. The diagnosis is thus made by a process of elimination. After the diagnosis is made, the patient is subjected to a period of preparation. This preliminary treatment consists in rest in bed, hot saline enemas and purgation, diuretics, a non-irritative urinary antiseptic, occasional catheterization and at times gentle prostatic massage. The high frequency spark is applied under local anesthesia with novocaine and adrenalin. The author uses a small calibre, indirect, close vision cystoscope, with a deflector to manipulate the wire. The wire is the smallest steel insulated wire obtainable. The end of the wire is carefully adjusted, so as to lie in contact with the inner margin of the bar. When the current is turned on, bubbles form; these should be washed away. A complete cut is made without withdrawing the wire. The cystoscope is then removed. There should be no bleeding. After the first application there will be a V-shaped cut, lined with grey slough. The second application is carried out after the slough has separated and the urine is free from flakes. At this sitting, the furrow made at the first application is widened. As a rule, no further applications are required, at all events for several months. The author reports on his first 25 cases. The last of the cases was completed 2½ years previously. Of these, the obstruction was undoubtedly inflammatory in 13. The patients have remained completely cured. Three patients were tabetic subjects, and relief was secured in two. In nine, the obstruction was due to middle lobe hypertrophy. Four of the patients have not had any treatment for five years; and are able to empty their bladders.

Three others have been freed from symptoms for 2, 3½ and 4 years respectively. The two remaining patients need prostatectomy, on account of lateral lobe hypertrophy. In two carcinoma cases the tumour formed a distinct bar, which caused obstruction. The treatment secured great relief for these patients. The author claims for the high frequency spark treatment of median bar obstruction the advantages that the patient is not incapacitated, that the relief can be effected without pain or hemorrhage, under the guidance of sight, that no raw surfaces are left, through which infection might gain an entrance, and lastly that by additional applications after the slough has separated, the exact degree of destruction desired can be secured.

##### (104) Perineal and Suprapubic Prostatectomy.

J. M. Gile, who has operated on 62 patients for the removal of the prostate, feels justified in regarding the perineal operation as more advantageous than the suprapubic, at all events in his hands (*Boston Med. and Surg. Journ.*, April 26, 1917). He has performed suprapubic prostatectomy 24 times, and has experienced 11 deaths, while he has carried out 36 perineal operations with four deaths. Recovery occurred in 47 patients, and in 42 there were perfect functional results. One patient was left with a permanent abdominal sinus, two had slight but permanent perineal sinuses, leaking only at times (in both there was malignant disease of the prostate), a fourth had a rectal fistula, also in association with malignant disease, and the fifth complained of partial incontinence of urine. In the series of 62 patients, six had malignant disease. The condition was complicated by vesical calculus in two cases, and once by non-malignant polypus of the bladder. The convalescence was disturbed twice by severe infection, once after the suprapubic and once after the perineal operation. One of the patients operated on by the perineal route died 40 days later of pulmonary embolism; another died of dynamic or intestinal stasis; the third died of supposed pyloric stenosis due to cancer of the stomach. The deaths after the suprapubic prostatectomy were due to suppression of urine, mixed pyogenic infections, tetanus, alleged surgical shock and hemorrhage. The average time of healing of all cases was 28 days, excluding the cases with a permanent sinus. The quickest complete closure took place in 11 days and the longest in 52 days.

##### (105) External Urethrotomy and Seminal Vesiculotomy.

Eugene Fuller has found that his former practice of dealing with acute infections involving the urethra, peri-urethral tissues and seminal vesicles by two or more separate operations was associated with serious disadvantages (*Journ. Americ. Med. Association*, July 28, 1917). Not infrequently the patients refused to submit to the necessary op-

erative procedures subsequent to the first intervention. He now performs a single operation. In the first place he places the patient in the knee-chest position, and opens up the seminal vesicles, and deals with them as the condition requires. Then he moves the patient into the lithotomy position, and incises the perineum by a free median incision, opens up the urethra and the neck of the bladder. If necessary, he undertakes the repair of the urethra and eliminates all urethral false passages. All foci of suppuration are drained, and he always employs a rubber tube inserted through the perineum into the bladder. At times he finds it necessary to keep the perineal wound open and to pack it with gauze. In other cases he closes the wound, save for that portion which is occupied by the vesical drain. Two tubes are required for the drainage of the seminal vesicles. All the packings and sutures are removed at the end of five days, and the tubes after ten days. He gives details of four cases, to illustrate his procedure. He has performed the single-stage operation in ten cases. Nine of the patients did well, while the tenth died of a pre-operative infection of the seminal vesicles with a streptococcus.

##### (106) Nephrectomy for Renal Tuberculosis.

F. S. Crockett is convinced that renal tuberculosis can be diagnosed early enough to permit of the removal of the kidney, before the infection has spread to contiguous tissues (*Urologic and Cut. Review*, July, 1917). He records two cases to illustrate his method of arriving at a diagnosis. In his experience, tuberculosis of the kidney may be suspected when there is frequent and painful micturition, when the urine is passed at night, and when the urine is smoky or turbid, but no bacteria can be detected on staining specimens of the sediment. He then proceeds to inject the urine into guinea-pigs, but warns his readers that a few tubercle bacilli may be present in the urine in the course of a tubercular infection of another part of the body, without renal involvement. Pus in the urine makes him highly suspicious of renal tuberculosis. The patients may retain weight, and their temperature may be normal. He proceeds to the removal of the kidney when the guinea-pig injected with the urinary sediment develops tubercular lesions.

##### (107) Thorium in Pyelography.

J. F. Burns contributes a short article on the advantages of thorium in solution as a pyelographic medium (*Journ. Americ. Med. Assoc.*, February 17, 1917). He maintains that there is no evidence that it acts toxically, even when applied in relatively large quantities. The solution is non-irritating. Pyelograms and cystograms prepared with this solution possess great clearness of delineation, and as the solution is quite clear, it is rapidly eliminated from the urinary tract. Another advantage of thorium is that it does not stain linen. It is quite inexpensive.



## Naval and Military.

The 338th list of casualties was issued on September 15, 1917. It contained the names of 36 officers and 812 men. None of the officers were members of the Australian Army Medical Corps.

The following announcements have appeared in the *Commonwealth of Australia Gazette*, No. 155, of September 13, 1917:—

### Army Medical Corps.

Captain Arthur Duncan Forbes, Royal Australian Medical Corps, is appointed Captain in the Australian Imperial Force. Dated 20th April, 1917.

#### To be Lieutenant-Colonel—

Major (temporary Lieutenant-Colonel) D. M. McWhae. Dated 20th February, 1917.

Lieutenant-Colonel D. M. McWhae is granted the temporary rank of Colonel whilst employed as Assistant Director Medical Services, Australian Imperial Force Depôts in England. Dated 20th February, 1917.

#### To be Lieutenants-Colonel—

Majors (temporary Lieutenants-Colonel) W. G. D. Upjohn, T. E. V. Hurley, B. Quick, H. R. G. Poate. Dated 20th February, 1917.

#### To be temporary Lieutenants-Colonel—

Majors J. C. Storey, P. Flaschi, W. E. Kay, E. T. Brennon, M.C., W. E. Grigor.  
Australian Army Medical Corps.

#### To be Lieutenant-Colonel—

Major (temporary Lieutenant-Colonel) R. Fowler, and to command No. 4 Australian Light Horse Field Ambulance. Dated 18th February, 1917.

#### To be Majors—

Captain G. E. Cole, No. 13 Field Ambulance. Dated 29th January, 1917.

Captain F. C. Burke-Gaffney, No. 2 Australian Stationary Hospital. Dated 18th February, 1917.

Captain (temporary Major) R. E. Shuter. Dated 19th March, 1917.

#### To be Major—

Captain (Honorary Major) R. L. Rosenfield, Australian Army Medical Corps. Dated 1st August, 1917.

#### To be Captains—

Honorary Captains H. W. B. Cairns, F. H. Beare, N. B. Hall, B. F. Moore, and E. L. Symons, Australian Army Medical Corps Reserve. Dated 7th August, 1917.

Honorary Captain A. K. Gault, Australian Army Medical Corps Reserve. Dated 20th July, 1917.

Robert Percy Young. Dated 14th March, 1916.

Henry Vicars Gillies. Dated 1st August, 1917.

David Peter Greenham. Dated 4th August, 1917.

John Patrick Horgan. Dated 21st August, 1917.

### 1st Military District.

#### Australian Army Medical Corps Reserve—

John Anthony Ernest Arthur Lavery and William Humphreys Jamison are to be Honorary Captains. Dated 1st August, 1917.

John Erskine Brown Maclean is to be Honorary Lieutenant. Dated 1st June, 1917.

The resignation of Honorary Captain G. S. Sameulson of his commission is accepted. Dated 31st July, 1917.

### 2nd Military District.

#### Australian Army Medical Corps Reserve—

Raymond Balls is Honorary Captain. Dated 13th July, 1917.

The resignation of Honorary Lieutenant P. Cliphsham of his commission is accepted. Dated 31st July, 1917.

### 3rd Military District.

#### Australian Army Medical Corps Reserve—

Thomas Alexander Wilson is Honorary Captain. Dated 1st August, 1917.

John Hemphill Rutter is Honorary Captain. Dated 15th August, 1917.

Thomas William Brown is Honorary Captain. Dated 25th June, 1915.

(This cancels the notification respecting date of appointment of this officer, which appeared in Executive Minute No. 213, 1916, promulgated on page 614 of *Commonwealth of Australia Gazette*, No. 35, of 16th March, 1916.)

The rank of Honorary Captain granted to H. E. A. Jackson, on page 1942 of *Commonwealth of Australia Gazette*, No. 110, of 24th August, 1916, is withdrawn.

### 4th Military District.

#### Australian Army Medical Corps Reserve—

Thomas Borthwick is Honorary Major. Dated 16th August, 1915.

The notification respecting promotion of Honorary Captain E. L. Borthwick to be Honorary Major, which appeared on page 1630 of *Commonwealth of Australia Gazette*, No. 86, of 20th July, 1916, is withdrawn.

### 5th Military District.

#### Australian Army Medical Corps—

The provisional appointments of Captains J. P. Kenny, V. O. Stacy, R. S. McGregor, N. B. Watch, and C. H. Shearman are confirmed.

### 6th Military District.

#### Australian Army Medical Corps—

Major (Honorary Lieutenant-Colonel) H. N. Butler, D.S.O., is Officer Commanding No. 9 Australian General Hospital (temporarily) (part-time). Dated 1st August, 1917.

### 2nd Military District.

#### To be Honorary Lieutenant-Colonel—

Honorary Captain H. S. Stacy, Australian Army Medical Corps Reserve. Dated 1st October, 1915.

### 6th Military District.

#### To be Honorary Lieutenant-Colonel—

Major H. N. Butler, D.S.O., Australian Army Medical Corps. Dated 1st January, 1916.

### Termination of Appointments.

The appointments of the undermentioned officers are terminated from dates stated opposite names:—

Colonel C. H. W. Hardy, D.S.O. Dated 21st August, 1917.

Colonel R. E. Roth, D.S.O., V.D. Dated 7th May, 1917.

(This cancels the notification respecting this officer which appeared in Executive Minute No. 350/1917, promulgated on page 1234 of *Commonwealth of Australia Gazette*, No. 82, of 7th June, 1917.)

Lieutenant-Colonel A. J. Meikle. Dated 21st August, 1917.

Captain V. McDowall. Dated 22nd August, 1917.

## AUSTRALIAN ARMY MEDICAL CORPS COMFORTS FUND.

We have to acknowledge the receipt of a contribution of £5 from Dr. E. Sirois, of Marburg, Q., bringing the total up to £58 1s. We have to rectify two errors which have been made in previous lists. Dr. Kerr Scott's name was incorrectly given as Dr. Kerr Smith (Brisbane). The amounts contributed by Dr. R. A. Parker and Dr. J. Ramsay Webb were reversed. We hope that our colleagues will accept our apologies for these mistakes, and that all the contributors will accept our sincere thanks. We are still prepared to receive further contributions from those who have not yet responded to our appeal.

## Obituary.

### ARTHUR HENRY GAULT.

Arthur Henry Gault, whose death took place on August 28, 1917, was born in Manchester in the year 1864, and was educated at the Manchester Grammar School. On leaving

school he entered Owen's College, and at the age of 23 secured the diplomas of the membership of the Royal College of Surgeons of England and licentiate of the Royal College of Physicians of London. In 1887 he took the degree of Bachelor of Medicine at the London University. He won the Turner Medical Prize during his final year at Manchester. Immediately after qualifying he became House Physician at the Manchester Infirmary, and later House Surgeon at the Ashton-under-Lyne Infirmary. In 1888 he came to South Australia, and settled at Mitcham, where he practised until the time of his death. His conscientiousness and diligence brought him a large number of patients, and assured his success as a general practitioner. In 1900 he again visited England, partly for the purpose of taking his M.D. degree, and partly to study what was being done in the old country and on the continent in the treatment of pulmonary tuberculosis. From that time onwards he specialized largely in pulmonary diseases. In 1910 he was appointed Assistant Honorary Physician at the Adelaide Hospital, and in 1913 full Honorary Physician. His re-appointment to the honorary staff, which is necessary every third year, according to the rules of the Hospital, took place last year. In order to facilitate the treatment of his patients in South Australia, he built the Nunyara Sanatorium at Belair. During the past few years his health began to fail, but he continued to work up to a week before his death.

Arthur Henry Gault was actively associated with the Methodists, and held several important offices in connexion with the Methodist Conference. He was regarded as an excellent lay preacher. He leaves a widow and one son, Captain Arthur Kyle Gault, who served in the Army Medical Corps as a private in Gallipoli, and returned to Australia after having been wounded. He then completed his medical course, passed his examinations for the degrees of M.B., B.S., at the Adelaide University, was registered in August, 1917, and is now on his way to the front with a commission to the Australian Army Medical Corps.

#### RONALD LENNOX HENDERSON.

The war continues to claim its sacrifices among the keenest and the most promising members of the medical profession. But few weeks pass without some fresh addition to the already considerable roll of honour. In our issue of August 25, 1917, we had the sad duty of recording the death from wounds of Captain Ronald Lennox Henderson.

Ronald Lennox Henderson was born in Toowoomba in 1878. He was educated at the Townsville Grammar School, where he matriculated in the Sydney University Junior Examination in 1893, winning the gold medal for the highest pass. On leaving Townsville, he spent about two years with the Union Mortgage Company at Rockhampton. Casting aside a commercial life, he entered the Otago University, New Zealand, and completed his first year of the medical course. He then proceeded to Edinburgh. In 1903 he graduated as Bachelor of Medicine and of Surgery. The following year was spent as House Physician at the Carlisle Infirmary, and, before returning to Australia in 1905, he also served as House Surgeon at the same institution. At the end of 1905 he started practice at Adaminaby, in the south-east of New South Wales, but after a time the attractions of the north drew him first to Lismore and then to Crow's Nest, in Queensland. His stay in Crow's Nest was a brief one. Having arrived there in 1913, he volunteered for active service early in 1915, and left with the Australian Imperial Force on the last day of July of that year.

His first destination was Lemnos. After the evacuation of Gallipoli, he was appointed Medical Officer to the 2nd Battalion, which was sent to France. In November, 1916, he had an acute attack of pneumonia, from which he recovered. He returned to active duty, and displayed such great courage and determination in the prosecution of his dangerous duties that he was awarded the Military Cross in June, 1917. He was wounded twice, and in the 331st list of casualties it was announced that he had died of the results of his second wounds, incurred in May. He had been removed to the Royal Herbert Hospital, at Woolwich, where he died on July 31, 1917. He leaves a widow and two infant children—a boy and a girl. The sympathy which the medical

profession has with his widow is tempered with pride—that Ronald Lennox Henderson was endowed with those qualities which make for the greatness of the British Empire.

#### WILLIAM MORGAN HUNN.

The death of William Morgan Hunn from heart failure took place on August 21, 1917. He was educated at the Prince Alfred College, Adelaide, and at the Adelaide University. He was a brilliant student, secured a "1st Class" each year, and won the Everard Scholarship in his final year by coming out at the top of the "1st Class." He took his double degree in medicine and surgery in 1905. During his student days he became infected with tuberculosis, and immediately after qualifying went into the country, where his health improved. He took a trip to Japan, and on his return to South Australia started in practice at Booleroo Centre. In 1912 he visited England. On his return his health became much impaired, and in May of the present year he was forced to relinquish his practice.

### Special Correspondence.

(By Our Special Correspondent.)

#### CANADA LETTER.

##### The National Service Board of Canada.

A conference of the National Service Board was held at Ottawa in February, when a number of recommendations were made. It was decided that efforts should be made to supply farm labour in the western provinces, where it was estimated fifteen thousand men would be needed in the spring, and that a national survey should be made with a view to supplying any deficiency which may be found to exist in essential industries. The Board undertook also to provide suitable occupation for men of the overseas forces upon demobilization and, with this in view, it is proposed to obtain detailed information from all Canadian soldiers overseas as to the work they are best fitted to undertake by reason of their former occupation and training. It was stated by Mr. R. B. Bennett, M.P., the Director-General of National Service, that the return of the national service cards had been beyond expectation. The question of woman labour was discussed, and it was stated that the demand for women workers in munitions had been met for the present, and it was advisable for women who were not actually in need of employment to throw their energies into Red Cross work or some similar branch of war work.

##### The Health of Munition Workers.

In spite of all precautions, it is to be expected that the health of those who are working upon the manufacture of high explosives in munition factories should suffer to some extent from the fumes of the chemicals employed. In Montreal several cases of poisoning from the vapours of toluene have occurred. It appears that these vapours have an exhilarating effect, and produce a feeling of intoxication, and that workers employed in the manufacture of trinitrotoluene sometimes expose themselves voluntarily to these fumes in order to obtain this effect. In one case of the poisoning, which occurred in a student attending the medical faculty of McGill University, this was done. The patient was a young man of about twenty years of age, who was employed in a munition factory upon the manufacture of trinitrotoluene during the months of July and August of 1916. He developed jaundice and became so weak that he was obliged to give up his work. However, he improved so much that in October he was able to resume his studies, though still slightly jaundiced when the session commenced at the beginning of October, but on October 18 was taken ill suddenly, with profuse hæmorrhages from the nose, bowels, and kidneys. He was admitted to hospital and died within forty-eight hours of admission. The post-mortem examination revealed diffuse and profuse hæmorrhages in



practically all the parenchymatous organs, the whole pelvis of the kidney and the ureter were blocked by coagulated recent blood, and there were hæmorrhages in the skin, pericardium and intestines. The left lobe of the liver was much diminished in size, collapsed, flat and extremely hæmorrhagic; the right lobe was enlarged, and showed a tremendous parenchymatous swelling, which was greyish and produced a peculiar relief-map appearance of the parenchyma around depressed vascular channels. The case is reported at length in the Scientific Reports of the Royal Victoria Hospital, Montreal, Series B., No. 1, which has just been issued. It is concluded from the findings at the autopsy that trinitrotoluene is not a parenchymatous but a vascular poisoning, which injures the endothelium of the blood vessels and lymphatics. Absence of fatty changes, coagulation necrosis and bile precipitation was marked. An examination of the nitrogen partition of the urine of five cases of such poisoning was made by Drs. Harding and Mason, of the Royal Victoria Hospital, Montreal, and the results of the investigation are reported on pages 21 to 26 of the Reports mentioned. It was found that the undetermined nitrogen was high in all the cases, and excessively so in three of them.

## Correspondence.

### THE TREATMENT OF SYPHILIS.

Sir,—Having read in the *Journal* an article by Captain Griffith on the subject of treatment of syphilis containing a number of statements and propounding several doctrines, which seem to me to be dangerous and hardly likely to create a favourable impression of Australian medicine if allowed to go from here to Europe or America unchallenged, I have felt it my duty to criticise the astounding expressions of opinion given in the paper referred to. My desire is solely directed towards the correction of what I regard as dangerous doctrine, hastily inferred from a year's experience with a small number of cases (200) by a man previously untrained in the practice of syphilology and, what is even more important, dermatology. If I seem unkind to this inexperience, I plead that I am only inspired by the sense of the absolute necessity of combating dangerous errors arising from faulty observation and inaccurate expression.

First, with regard to the discussion of the subject of early diagnosis, Captain Griffith displays a remarkable confidence in stating that in the period of a year's work he met with only one case "where the clinical diagnosis of the primary lesions was doubtful." This, being labelled as "clinical" and "primary" presumably excludes all diagnosis by presence of secondary lesions, Wassermann reaction, search for spirochaetes, etc. I must congratulate Captain Griffith on his acuity, which I am sure is not approached by any practising dermatologist or syphilologist of the present day. Speaking absolutely on my own behalf, I may say that, personally, although I see a great number of clinically typical hard chancres, I also see very many in which I am only too glad to summon the aid of laboratory methods. In fact, I think that scarcely an evening clinic passes without one or two or more cases being examined for spirochaetes to enable a diagnosis to be made a few days earlier than would otherwise be possible.

Captain Hunter Griffith, to excuse his lack of appreciation of these helpful methods, pleads the difficulty of demonstrating the presence of spirochaetes, "owing to imperfect methods of staining," and repeats the plea in the same column, but seems to be completely unaware of a method known as dark field illumination, by which the spirochaete can be recognized quickly, unstained, and all alive. There are so many descriptions of this method in the literature of the last ten years that I will not here trespass upon the valuable space of the *Journal* in order to describe it, but will merely remind Captain Griffith that it is available and valuable, and suggest capillary tubes for collection and transmission of serum to Dr. Harris, of the Brisbane Laboratory of Microbiology and Pathology, if his own microscope is still "astray."

I should like to ask Captain Griffith please to enlighten the medical world as to the characteristics of a primary sore available to clinical examination which are present in "the great majority" (all but one of his series), so as to obviate the necessity of resorting to the "finer methods of diagnosis" and enable treatment to be instituted at the earliest moment, since he can be sure that they will be accepted with huge delight by all interested in the subject. So far from being, as Captain Griffith supposes, "outside the scope of the paper," they should, I would humbly suggest, be the most important item of information vouchsafed therein.

A point in the differential diagnosis between hard and soft chancre which is given I cannot support, *viz.*, that soft chancre invariably responds rapidly to "mercurial lotions, ointments and powders, healing usually being complete in three or four days." Soft chancre is comparatively rare in Sydney, so perhaps I should not do more than say that during seven years' experience at the Royal Prince Alfred Hospital I have never seen a soft chancre heal in three or four days under such treatment, and have not infrequently seen them last a much longer time, in spite of such treatment.

Next, while sympathizing with Captain Griffith in his desire to excise the primary sore where possible by circumcision, I am indeed envious of his good fortune in finding this operation possible in 50% of the cases, having due regard to his doctrine that "unless one can be tolerably certain that the whole scope of the chancre can be excised, it is advisable to leave it alone surgically." I have no doubt been unfortunate in having a series in which the involvement of glans, corona or preputial fold and underlying tissues were involved in a much larger proportion than 50%; I should say nearer 90%.

Next, I was always under the impression that bubonocoele was a hernial protrusion that had not escaped from the external ring, and, as Captain Griffith states that surgical interference for this condition should be regarded as the last resort, I feel I must rescue him from the wrath of the surgeons by pointing out to him that he has in this instance at any rate strayed from the straight and narrow path of scientific accuracy and mistakenly applied this term to syphilitic inguinal lymphadenitis.

However, when he says that "swollen, inflamed, tender and (*mirabile dictu*) fluctuating glands resolve very quickly after intravenous arsenical medication," I feel impelled to point out that here again he has had a marvellously lucky series to find a syphilitic bubo fluctuating in a series of 200 cases of all stages, since the softening of a syphilitic gland is held to be so excessively rare as to be less common than a tubercular complication of the syphilitic sore or gland.<sup>1</sup> I personally have not yet been fortunate enough in my seven years at the Royal Prince Alfred Hospital to see there or elsewhere a syphilitic bubo fluctuant, except as a result of complication with soft sore, or ordinary pus organisms (in which case, of course, the use of arsenobenzol would have no effect on the softening).

Rupia also is rare, in my experience about two instances coming under view at R.F.A.H. each year, and those in very neglected cases; here again I must congratulate Captain Griffith on his good fortune in having so many cases in a year as to be able to generalize upon them—or perhaps it would be possible to trace this frequency to the universal use of "Mist. Z. Coy."

Captain Griffith in the second part of his paper ingeniously disclaims all special knowledge of syphilis before he "started out to treat syphilis in the army" a year ago, and then goes on to lament his disappointment at the discovery of the toxicity of arsenobenzol, which he apparently attempted to "pour in" to his patients in an admittedly enthusiastic and amateur fashion.

However, even allowing for previous inexperience, he seems to have been unfortunate (no doubt by way of compensation for his later great good fortune in finding rare manifestations of the disease in such profusion in 200 cases of all stages of syphilis) in discovering that arsenobenzol produced in "almost every case a most marked and often alarming reaction even when given in small doses." His associates seem to have been even more unfortunate in their experience, as in the case of one of them "a number

<sup>1</sup> Brocq, *Traité de Dermatologie*.



of deaths had followed its administration." Now, without for a moment denying the toxicity of the arsenobenzol drugs, or pooh-poohing any warning as to care in administration, I cannot for the life of me reconcile accuracy of observation and expression on the part of Captain Griffith with the great disparity from results as obtained in the R.P.A.H., where "Mist. Z. Coy." is not yet used. Also I should like to congratulate the medical profession in Queensland on having an enviably complacent Coroner's Bench, and long-suffering public to tolerate without any fuss the occurrence of "a number of deaths" from the administration of arsenobenzol.

The fact is that the secret of Captain Griffith's experience is expressed in his own words, but he seems to have been quite unconscious of their significance, though he ought to have thought of it when he wrote "even in small doses." I quote once more, "The distilled water, normal soda and saline solutions had to be taken on trust, these being supplied from the Base Medical Stores." If Captain Griffith had glanced even lightly over some of the very instructive treatises on the administration of the drug, he would have found it quite scientifically impossible to "take the distilled water, etc., on trust." He would have found also that if he injected this "trusted" distilled water or saline solution after due boiling, but without any addition of arsenobenzol or other drug, into the veins of his patients, he would have got nearly the same reaction as with the addition of arsenobenzol. And he would, moreover, have found that had he used water freshly distilled, (within 24 hours) he would rarely, if ever, have had "marked," not to speak of "alarming" symptoms from the administration of arsenobenzol; and he could have spared himself the brain-fag inevitable from the invention of "Mist. Z. Coy.," with its truly marvellous effects. In fact I would suggest that it happened that when he began to get better results it was probably because all the old *aqua dest.* in Base stores was used up, and he got a fresh brew of less toxic character; at any rate I offer this suggestion in lieu of a blind faith in "Mist. Z. Coy." and citrates generally.

The facts are that from August 31st, 1916, to August 31st, 1917, there were given at the R.P.A.H.

To out-patients .. 1765  
To in-patients .. 500

Total .. 2265 doses of 0.4 gm. arsenobenzol drugs.

These were made up of—

Kharsivan .. .. .	750
Arsenobillon .. .. .	1200
Galyl .. .. .	200
Arsemin (Japanese) .. .. .	115
Total .. .. .	2265

Strangely enough, there were no deaths at all, and marvellous to relate marked reactions were rare, and dangerous reactions unknown. And yet, and I feel I must accentuate this point, not one single solitary patient received a single solitary dose of "Mist. Z. Coy." nor anything approaching it.

I offer for what it is worth the following suggestion, viz., that at R.P.A.H. the water used for preparation of saline solution and solution of arsenobillon or other arsenobenzol drugs, is always distilled within a few hours, generally within two hours of its use; that a minimum quantity of fluid consistent with proper dilution of the drug is injected (not more than 200 c.cm. and often much less).

Now what reactions of a mild character do occur are found to depend much more upon the dexterity and absence of fuss on the part of the resident who administers the injection, and upon the consequent absence of excitement or shock, than upon the drug injected.

But from all cases of albuminuria arsenobenzol in any form or dose is withheld, unless the trouble is syphilitic, in which cases minute doses are sometimes given with immense precautions and after referring the case to a physician for opinion.

In my earlier experiences with "606" in 1911 I considered the existence of chronic nephritis to permit the administration of "606," but unfortunately the patient died uræmic, and never since then have I allowed a patient to receive an arsenobenzol drug when I knew, or even suspected, that chronic nephritis existed.

But I notice that Captain Griffith now considers the "testing of the patient's urine unnecessary." In this he stands alone, apart from all authorities on the use of the drug, and I prophecy the same downfall as I in my rashness suffered, and I don't believe that even citrates will save him when the proper case comes along.

The periodical testing of urine is even considered necessary by most authorities for the proper conduct of mercurial treatment, but presumably this trifle is waived with the same airy nonchalance which characterizes Captain Griffith's dismissal of the urine test in "606" administration.

In continuation I find herpes is mentioned as "a fairly constant aftermath of the arsenical treatment." "Fairly constant" I read to mean at least a majority of cases. Yet we see it in R.P.A.H. in not more than 1% of cases, and yet citrates are never used and "Mist. Z. Coy." is unknown. That herpes is a fair indication of the frequency and degree of febrile reaction is probable, but I would suggest that it is, in view of our figures from R.P.A.H., more nearly an index of the toxicity of the "trusted" distilled water from Base Medical Stores than of the drug we both use with such widely different results.

Nor can I support the statement that "the arsenic has a very noticeable and devitalizing influence on the gums and oral mucosa generally," and especially cannot endorse the dictum "the arsenic has a more powerful action on the mouth than mercury," and I believe the observation of Captain Griffith is unique to an extent unrivalled by any outside his paper.

One would think the criticism exhausted but a gem which must be included in the collection is the airy dismissal of Adams' Cream, on the ground of "the mercury not being triturated up fine enough for suspension in the medium." This is too rich, and in the absence of Adams at the war I feel impelled to point out on his behalf that the one essential and characteristic quality of Adams' Cream (as evolved from a lot of very hard work and accurate observation of thousands of cases at the Naval Hospital at Haslar) is that it must be triturated to the last degree of fineness, and anything that is not so triturated is not Adams' Cream. And the very reason which Captain Griffith gives for preferring the ordinary old grey oil, we always advance for the use of Adams' Cream, viz., that its suspension is as nearly perfect as possible owing to minute division by patient trituration, and the dosage is consequently even and accurate. I should advise Captain Griffith to read Adams' article and concentrate more on such insignificant details as the dispensing of his preparations and the freshness of his solvents if he wishes to avoid trouble.

As to iodides, their usefulness as curative agents as distinguished from their action in healing lesions, is much debated, as they have no influence on an existing positive Wassermann. The possibility of their usefulness in primary syphilis is, in spite of Captain Griffith's assurance, extremely remote.

As to the citrates I cannot say anything beyond that I have never used them, nor seen them used, nor read of them being used (before September, 1917), as a curative agent in syphilis, and that though that is no argument against their usefulness, I find they have been credited with so much that they demonstrably don't do, that I am tempted to believe that they don't do anything at all more than would be done by pure water sterilized, or, better still, for external application normal saline solution.

It will be noticed that all doses given in R.P.A.H. were 0.4 grammes. This is because all men are treated as out-patients, and the in-patients are women, often in poor general health. The use in private practice of 0.6 gm. under similar conditions has not resulted in any severe or alarming reactions, except in one case, which showed acute

jaundice—the only case of its kind I have seen in many thousand injections.

In conclusion, I would advise Captain Griffith to remember that there is a full and bountiful literature on this subject, easily accessible and very instructive. I would point out to him that in the R.A.M.C. there has been done a lot of first-rate work. Off-hand I can mention the names of Lambkin, Keogh, Harrison, and could give him many more if he would like to read their work. There is also a hospital in Rochester Row, London, where army syphilitics are treated and where much valuable work has been done by the R.A.M.C. officers, whose reports are easily obtainable in different publications.

But I should like to beg him and implore the rest of the Queensland medicos to "put not their trust" in citrates nor the distilled water from the Base Medical Stores, and above all to test the urine of patients for "606" injection.

With apologies for trespassing upon your valuable space to this extent.

Yours, etc.,

E. H. MOESWORTH, M.B., Ch.M.,  
Honorary Physician Diseases of Skin and Syphilis Clinic,  
Royal Prince Alfred Hospital, Sydney.  
September 17, 1917.

### Medical Appointments.

Dr. William George Armstrong, Senior Medical Officer, has been appointed Deputy Director-General of Public Health and Senior Medical Officer of the Department of Public Health of New South Wales.

### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xv.

Hospital for the Insane, Goodna, Queensland, Second Assistant Medical Superintendent.

### Medical Appointments.

#### IMPORTANT NOTICE

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
<b>TASMANIA.</b> (Hon. Sec., Bel- erive, Tasmania.)	Medical Officers in all State-aided Hospitals in Tasmania.
<b>VICTORIA.</b> (Hon. Sec., Medi- cal Society Hall, East Melbourne.)	Brunswick Medical Institute. Bendigo Medical Institute. Prahran United F.S. Dispensary. Australian Prudential Association Pro- prietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.
<b>QUEENSLAND.</b> (Hon. Sec., B.M.A. Building, Ade- laide Street, Bris- bane.)	Medical Officers to the Selwyn Hos- pital, North Queensland. Brisbane United Friendly Society In- stitute. Warwick Hospital.

Branch.	APPOINTMENTS.
<b>SOUTH AUS- TRALIA.</b> (Hon. Sec., 3 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide.
<b>WESTERN AUS- TRALIA.</b> (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
<b>NEW SOUTH WALES.</b> (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance Association and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phoenix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Penrith, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wall- send.
<b>NEW ZEALAND: WELLINGTON DIVISION.</b> (Hon. Sec., Wel- lington.)	Friendly Society Lodges, Wellington, N.Z.

### Diary for the Month.

- Sept. 25.—N.S.W. Branch, B.M.A., Medical Politics Com-  
mittee; Organization and Science Committee.
- Sept. 26.—Vic. Branch, B.M.A., Council.
- Sept. 27.—S. Aust. Branch, B.M.A. Branch.
- Sept. 28.—N.S.W. Branch, B.M.A., Branch (Ordinary).  
Election of two Members of the Federal Committee.
- Sept. 30.—Vict. Branch, B.M.A., Last Day for Election of  
Two Members to Federal Committee.
- Oct. 2.—N.S.W. Branch, B.M.A., Council (Quarterly).
- Oct. 3.—Vict. Branch, B.M.A., Branch.
- Oct. 5.—Q. Branch, B.M.A., Branch.
- Oct. 5-6.—N.S.W. Branch, B.M.A., Annual Meeting of  
Delegates of Local Associations with the  
Council.
- Oct. 9.—Tas. Branch, B.M.A., Council and Branch.
- Oct. 9.—N.S.W. Branch, B.M.A., Ethics Committee.
- Oct. 11.—Vict. Branch, B.M.A., Council.
- Oct. 12.—S. Aust. Branch, B.M.A., Council.
- Oct. 12.—N.S.W. Branch, B.M.A., Clinical.
- Oct. 16.—N.S.W. Branch, B.M.A., Executive and Finance  
Committee.

#### EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any  
circumstances be returned.

Original articles forwarded for publication are understood to be offered  
to *The Medical Journal of Australia* alone, unless the contrary be stated.  
All communications should be addressed to "The Editor," *The Medical  
Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney,  
New South Wales.